



Practitioner's Docket No. 3293.004A

*47-17-34*  
*TP*  
**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Ruggero M. Santilli

Application No.: 09/826,183

Group No.: 1714

Filed: 04/04/2001

Examiner: C. D. Toomer

For: NEW CHEMICAL SPECIES OF CLUSTERS

**Mail Stop: Petitions Branch  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450**

**PETITION TRANSMITTAL LETTER**

1. Applicant herein submits the attached Petition For Appointment of New Examiner In a Different Art Group with declarations from noted scientists.
2. If a petition fee is due and payable for this submission, please take the petition fee from deposit account 503368. Applicant is a small entity.

Dennis G. LaPointe

A handwritten signature of Dennis G. LaPointe.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ruggero M. Santillo )  
S.N.: 09/826,183 ) Examiner: CEPHIA D. TOOMER  
Filed: April 4, 2001 ) Art Unit: 1714  
Confirmation No.: 9175 )  
For: NEW CHEMICAL SPECIES OF CLUSTERS )  
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)

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I hereby certify that this **PETITION FOR APPOINTMENT OF NEW EXAMINER IN A DIFFERENT ART GROUP** is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dennis G. LaPointe  
Dennis G. LaPointe

**PETITION FOR APPOINTMENT OF NEW EXAMINER IN A DIFFERENT ART GROUP**

M/S: PETITION  
c/o: Office of Assistant Commissioner - Ester Keplinger  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

It pains Applicant and his undersigned representative to be placed in a situation as to leave Applicant no choice but to respectfully requests that a new Examiner be appointed to examine this case. Applicant, Ruggero M. Santilli, has a very real perception that he is being treated extremely unfairly and that his claims are not being examined objectively and has accordingly requested that this petition be filed on his behalf.

For the reasons stated below, applicant perceives that he is not being treated fairly by the examiners and that his invention is not being objectively examined. He further believes that the examiners are being influenced by the scientific community in academia who rely on grant funds from the petroleum industry to specialize in petroleum research and development work. Effectively, applicant who is a dual citizen of the US and Italy, now has a deep distrust for the patent office and has sensed that because the examiners refuse to consider the detailed specification and have summarily dismissed the specification without stating ANY technical reasons for such dismissal, that the examiners may be corrupted by the scientific community working in the petroleum industry.

It would appear that the examiner in this case simply can not understand the technical substance and supporting tests data she is reading in the specification that supports the claims of the patent application. One reason may be that the application is not in the proper art group. The application in question had been assigned to an examiner in the 1740 art group who was later transferred to the 1711 art group (this examiner had admitted to applicant that she was not qualified to examine the application and simply did not understand the technology). The application was then reassigned to the current examiner in the 1714 art group. The 1714 art group deals with polymer chemistry, which is totally unrelated technology to the present invention.

The present invention deals with a novel chemical structure of molecules and dimers under a magnetic bond which maintains the structure in a stable form. It is an invention that requires a thorough understanding of chemistry and how a molecular bond may be altered under certain conditioned. In several telephone interviews and one personal interview with examiners of the 1711/1714 art group, it is clear from the repeated questions and remarks from the examiner (and the supervisor). They have admitted that they do not understand how the invention works leading the examiner of record to conclude that the invention appears to be contrary to chemistry principles as they have been educated, therefore, the invention can not exist or is not enabled.

For example, the examiner has stated that "it is clear from known principles of physics and chemistry that the instant compositions cannot exist according to conventional theory." So instead of reviewing the specification which in detail describes how to create the new species having a magnecular characteristic to create clusters of molecules and atoms, and specifically pointing out what is in error in the description and the test results of the produced gas, the examiner simply concludes that "No assertions of such a population of clusters have been recognized or verified by the scientific community." Because the "clusters (therefore) cannot exist, the claims are not enabled."

The examiner has stated that “the vast majority of the scientific community has held the belief that a population of clusters (as claimed by applicant) is not attainable,” and there “is no prior art showing materials that qualify as a population of clusters.” There is no prior art because it is a novel finding. But more importantly, applicant’s work has been published in world wide Journals including the International Journal of Hydrogen Energy (3 articles and 1 in press), Kluwer Publications, among others. The examiners have been provided videos demonstrating how the new species is created and showing its use in automobiles. The specification includes test data verifying the resultant new species. When confronted with all this, the examiner and her supervisor have simply dismissed it as because the scientific community has yet to GENERALLY accept the invention, then it just can not exist. No technical reasons have been provided yet for any rejections other than it just can not exist.

The fact is that very few scientist in the academia currently research in this field as the potential for energy use for the current invention will alleviate the need and use of petroleum based energy, a technology which is the bread and butter of many scientists throughout the world. However, more and more scientists are looking into alternative fuels and as a result are taking a serious look at applicant’s technology. Hydrogen Technology Applications, Inc. of Clearwater, Florida is now using the technology in electrolyzer systems and is currently developing its use throughout Europe and China and has been in serious dialog with the Department of Energy regarding the stable production of hydrogen clusters for automobiles. Applicant has sold equipment to produce the invention throughout the world, including Italy, China, Greece and Israel. Test results have been indisputable that the produced gas is in cluster form, especially when considering the resultant increase of a.m.u. of a cluster of atoms.

In addition, several scientists have now generally accepted the work of applicant. Some of the declarations from just a few of these scientists are attached herein as proof that the examiner’s summary statement, without support, that the scientific community has not accepted applicant’s theory of magnecules is without basis. See statements of Professors Erik Trell, Ing. Giorgio Beghella Bartoli, T. Nejat Veziroglu of the United Nations Industrial Development Organization, Jeremy Dunning-Davies, and Ronald B. Cole, Director of Applied Hadronics in Ukiah, California. Other declarations are forthcoming within the next two weeks from scientists throughout the world.

As noted above, applicant has sent videos of equipment that make the new species, vehicles that drive solely with the produced novel gas having the novel chemical structure supported by evidence that conventional gases have volatile and/or polluting emissions while emissions from a vehicle using the novel species of gas has emissions far below the acceptable standards of the EPA, even without the use of a catalytic converter. Independent labs have verified the results of the new species.

But the current examiner and her supervisor have chosen to ignore the analytical results of these labs (detailed in the specification) because it means that a new species has been created that is stable for use, yet such a specie cannot exist in the minds of the examiners because the species is not readily understood using chemistry as we know it today. They ignore the detailed analysis described in the specification. Because this is evolving technology, there is no prior art

that the examiners can find so instead of allowing the claims, the examiner have taken an unreasonable position that absent prior art and recognition from MOST scientists, then the invention must be non-existent. When in fact, several systems have been built and sold worldwide where the new species is being produced and produced gas representative of the new species has found worldwide acceptance, especially in Europe and Asia.

Applicant believes that based on the organizational structure of the patent office, that **art group 1743 (analytic chemistry)** may be the more appropriate art group with examiners who may have the experience to deal with and understand the specification, including the independent lab test results detailed in the drawings and written description, and claims of this novel new species.

Very respectfully,

Dated: 7/12/06



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For: NEW CHEMICAL SPECIES OF CLUSTERS )

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Erik Trell, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it relates to the principles embodied in the new chemical species of clusters.

2. My curriculum vitae is attached herein.

3. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. In order to provide evidence of universal acceptability and applicability, I provide the following comments in the same order as those of the examiner concerning my independent observation of the invention claimed by Dr. Santilli and/or my understanding of the new species of clusters.

4. This I will do in relation to a recent highly qualified large-scale scientific/industrial project plan in Norway, which holds a world-leading position in involved fields. The objective at hand is Carbon Dioxide recycling where clusters are highly productive both in process and output; in practice amply documenting that contrary to the examiner's statements there are effective enablement, operability, utility, let alone acceptance of the invention both scientifically and industrially.

The project's background is posed (*from the project description*) "by the environmental problems related to global warming, believed to be caused by the increased emission of greenhouse gases (GHG), especially Carbon Dioxide that accounts for 77 percent of the world's total GHG emissions....increased from about 2.5 billion tons to 5 billion tons from 1900 to 1950. In 2004 the volume is well above 25 billion tons. Further, the predictions of Carbon Dioxide production in the near future are far from reassuring. Rather than decreasing, the forecasts estimate a significant increase, as long as fossil fuels remain a the main source for power and electricity production....there are many different strategies trying to remedy this alarming environmental situation...(but)...so far these separation installations are large and expensive, and only feasible under specific conditions", whereas the "project advances a radically new approach to CCS, however, with full possibility of integration. Groundbreaking scientific achievements in mathematics and the hadronic sciences led to the prediction and experimental verification of the new chemical species.....bound together by a contact force in the so-called iso-electron (Cooper pair), presenting many interesting attributes and highly promising possibilities for 'ecological technologies'....with a wide range of applications in relation to new clean energies and fuels".

Against this established background, the implementation focus is to: “a. Mobilize the best knowledge from the scientific field of Hadron Mechanics, and b. couple it with SINTEFs (*Norway State Natural Science and Technological Research Institute*) research on Carbon Dioxide handling, containing our internationally leading research groups on Carbon Dioxide capture, transport and storage, gas technology and chemical process technology”.

From this and other projects and sources, it is evident that the examiner’s general statement on Page 2 that the “disclosed invention is inoperative and therefore lacks utility” is wrong, and lacks substantiation. The given argument on page 3 that “it is clear from known principles of physics and chemistry that the instant compositions cannot exist according to conventional theory” clearly refers to the prior art quoted in the preceding paragraph of the application, and ignores the next section in this that “only when a gas is forced to pass at high pressure through a restricted area surrounding an electric arc of a PlasmaArcFlow Reactor of the present invention can the chemical species of clusters be produced in which a chemical species of molecules is turned into an essentially pure population of clusters”. A new invention virtually by definition extends “conventional theory”, so, in fact, the examiner’s conclusion is doubly misleading, as is his overall vindication so decisive for the ensuing rejections that “no assertions of such a population of clusters have been recognized or verified by the scientific community”. He extracts a diametrically opposite corollary from the quoted passage, fails to show any reference supporting his allegation, and neglects ample presented experimental evidence as well as qualified recognition, e.g., by prominent national organs like SINTEF.

The further rejection on page 3 and 4 “as failing to comply with the enablement requirement” obviously falls for the same aforesaid reasons and facts, and this continues to apply in the ensuing detailed considerations on “undue experimentation”:

- (1) *The breadth of the claims*; Inoperability and lacking enablement arguments manifestly wrong.
- (2) *The nature of the invention*; Total lack of substantiation by the examiner that “the vast majority of the scientific community has held the belief that a population of clusters that are detectable via peaks in mass spectrometry but not by IR or UV spectrometry is not attainable”. And firstly: “has held” is in the past, secondly: a “belief” is not scientific, thirdly: legitimate references of the proffered kind are lacking and, fourthly: all experimental and other evidence as well as ample recognition and enablement by leading instances, like SINTEF, are in direct contradiction to the examiner’s inferences.
- (3) *The state of the prior art*; One wishes to remind the patent examiner that a new invention by necessity transcends prior art. As a scientist I have, with respect, to report that I find the examiner’s reasoning here paradoxical.
- (4) *The level of one of ordinary skill*; This is innuendo, again devoid of substantiation and reference, and can not, if anything, have other ground than hearsay since it is quite against the very empathy and accent of true Science and Scientists as well as what, as only to small extent here summarized, has already been recognized, enabled and implemented in reality.
- (5) *The level of predictability in the art*; Ditto
- (6) *The amount of direction provided by the inventor*; It has certainly been enough to enable e.g. SINTEF and many other prominent artisans and organs, and the applicant’s

provision of "specific process steps" are explicit to the extreme degree of ready apparatus.

- (7) *The existence of working examples and (8) the quantity of experimentation needed to make use of the invention*; See above. The examiner refers to "the time the invention was made" and since then much has happened which makes the examiner's objections obsolete and erratic. In actual fact, there is a growing widespread acceptance in the most qualified scientific circles of Professor Santilli's quintessential findings as manifested, for instance, in the positive review already in the beginning of this first decade of the third millennium in the renowned forefront *International Journal of Hydrogen Energy*; putting it's eminent seal of recognition and approval by the printing. One is intrigued by the examiner's aims and motivation and cannot avoid the feeling of bias and/or evasion. He ends his report somewhat wantonly quoting that "a patent is not a hunting licence". No, but neither is an invention a sitting prey, but a lawful subject holding the highest prospect and promise of progress and prosperity in a grand Nation such as U.S.A. renowned for always supporting and promoting actual merits and potential in accordance with the liberal spirit and accord of its noble constitution, aspirations and civil rights alike. Inventions are the very substrate for this advancement and entitled to a careful digestion instead of careless rejection in the accountable Office.

Dated: 10/7 2006

Erik Trell  
Declarant - Erik Trell

CURRICULUM VITAE



Erik Trell, Born 4th of June 1939 in Trollhättan, Sweden. Married, two children.

Started medical studies in Uppsala 1960. M.D. 1967 at the University of Lund, Ph.D. Dissertation (on Pulmonary Hypertension) 1972 at the Medical Department, Malmö General Hospital, University of Lund (Chief and Tutor Jan Waldenström). Docent in Internal Medicine the same year there. Specialist degrees in Internal medicine and Cardiology 1971, and in general medicine 1984.

Resident S:t Lars Hospital Lund (Psychiatry) 1964-67, and Malmö General Hospital Hospital, Department of Internal Medicine 1967-72 and Endocrinology 1972-73.

1973 – 1982 Associate Professor and Chief, Department of Preventive Medicine, Malmö General Hospital, 1982 – 1983 Research Fellow Swedish National Association against Heart and Chest Diseases, 1983 – 1987 Associate professor in General Medicine at the Department of Community Medicine in Malmö, Lund University. Since 1987 Professor in General Medicine and Chief, Department of Primary Health Care and General Practice, Faculty of Health Sciences (Hälsouniversitetet), University of Linköping.

Advisory functions within WHO and International Agency for Research on Cancer. Author and co-author of c:a 300 articles in peer-reviewed medical scientific journals (c:a 150 of them retrievable via PubMed: <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?DB=pubmed>) and in addition c:a 200 congress papers, abstracts, book chapters etc.; in the 70's and 80's mostly within Cardiology, Diabetology, Alcohol Diseases, Cancer and Preventive Medicine, currently mainly in General Medicine, Medical Computing and Informatics, Health Policy and Health Systems Research, with international consulting and tutorial assignments also internationally, mainly in Greece, the Balkans and India . I enclose here the two latest pages in my reference list.

The medical research has involved a number of early/innovative achievements, first in Clinical Medicine, then with the comprehensive Department of Preventive Medicine in Malmö including e.g. alcohol intervention, mammography and for the time pioneering on-line computer system, and in later years by development of interactive media based health screening and monitoring programmes (e.g. "Healthometer"), and health policy implementation both globally (WHO Regions for Health Network) and locally (e.g. county of Östergötland and Crete).

Studies in Physics and mathematics were catalysed by attempts of applying Lie group and algebras to (rotational) electrocardiography representation, and have then developed separately and in increased collaboration with the Institute for Basic Research as well as the Calcutta Mathematical Society and other organs. The aim is to complement theoretical knowledge and insights with real structural rendering enabling further exploration and understanding by nanotechnological methods.

I here enclose the last page of my medical reference list, plus a list of physical/mathematical publications. More specifically I refer to my book review in the international Journal of

Hydrogen energy on Professor Ruggero Maria Santilli's book "Foundations of Hadronic Chemistry with Applications to New Clean Energies and Fuels" (Available online at [www.sciencedirect.com](http://www.sciencedirect.com) International Journal of Hydrogen Energy 28 (2003) 251 – 253 [www.elsevier.com/locate/ijhydene](http://www.elsevier.com/locate/ijhydene)).

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## Book review

### **Foundations of hadronic chemistry with applications to new clean energies and fuels**

**R.M. Santilli; Kluwer Academic Publishers, Boston,  
Dordrecht, London, December 2001, ISBN 1-4020-0087-1**

Erik Trell

Linköping University, Linköping, Sweden

Available online 10 April 2002.

Everything has a history—or two. When reviewing a pioneering treatise like the Italian-American phycisist Ruggero Maria Santilli's ground-breaking monograph, "Foundations of Hadronic Chemistry With Applications to New Clean Energies and Fuels", some epistemological reflections would seem to be extra warranted because of its virtual backwards-to-the-future renaissance of Physics, Chemistry and Mathematics as equivalent powers in the synopsis. A serious scientific dilemma nowadays is otherwise that the latter discipline has seized supreme command and that, as stated by William M. Honig [ 1], the ruling mathematical doctrine "since the 1920s? has had a stultifying effect on developments in physics".

This is not how it used to be, when Nature directed. It is of course a primordial conception that Existence springs from a synthesis of opposites/adjacents, like in the Nordic Mythology, where life whirls in the thin tempered interstice (Ginnungagap) between the outer, rectilinear, openly infinite deep-frozen darkness of Niffeheim, and the inner, blazing, lighting-fast rotating, closely infinite fire-ball of Maspellsheim [ 2]. Even earlier, for instance, as expressed by the Yin-Yang symbol, a similar process was apprehended in the Orient of a spiraling transition between the complementary endless forms of Straight contracting into Round, the immense collective difference of which at the Cosmic level after long-winded journey (it is tempting to infer) disperses everywhere over the surface of the perfect sphere as the last decimal of  $\pi$ . In consequence, and with pronounced bearing to the mathematics which Professor Santilli has disclosed, there is inherent motion in this projection because the realisation comprises its own automatically congruent infinitesimal operator, or iso-unit.

Analogously it applies to the ancient Greek—but vice versa. They "are famous for a completely brilliant idea, namely, to use spatial images to represent numbers", where, however, "Euclid's Mathematics was closely associated with his concept of the world, which in accordance with Aristotle was that the Universe is enclosed in a sphere, in the interior of which space and the bodies full-fill the properties of Euclidean Geometry" [ 3 ]. So, in the Occident, Mathematics came to assume a perspective, falling from the vaulted firmament to the straight line and ultimately the vanishing intersection point as irreducible reference and elements. This orthogonal architecture of Western Mathematics where the static terms do not supply any kinetics (but a transcendental First Cause provided *primum movens*) persisted also after the Arabs replaced implicit figures and explicit constructions with algebraic letters and arithmetics, as can be seen, e.g. in the epoch-making doctoral thesis of Marius Sophus Lie, *Over en class geometriske transformationer* [ 4 ], from the English translation of which [ 5 ] the following is quoted:

*"The Cartesian geometry, namely, translates any geometric theorem into an algebraic one and thus of the geometry of the plane renders a faithful representation of the algebra of two variables and likewise of the geometry of space a representation of the algebra of three variable quantities" ... "the geometrical transformation that is founded upon the Poncelet–Gergonne reciprocity can be perceived as consisting of a transition from a point to a straight line as element" ... "The in the following presented new theories are founded upon the fact that one can choose any space-curve which depends upon three parameters as the element of the space" ... "each point in space ... is associated with a cone, namely, the collection of tangents ... that go through the point in question" ... "A partial differential equation of the first order between  $x, y, z$  is ... equivalent to ... finding the general surface which in each of its points touches a cone associated with the point in question ..."*

Now, Lie revolutionised the mathematical comprise and compass by expanding these operations back to spherical and related geometries and clarifying the sets of continuous transformation groups deployable in and between them. But the inherited defect persists in the cores of the functions, that their constituent lines and points are left without. When Nanotechnology at all fronts is now approaching the genuine footing of tangible reality, it discontinuously halts at the very threshold where the elementary particles substantially enter: what are they, and how are they? It is comparatively more and more surrealistic to accept them as primarily mechanical points/packets/waves rigidly oscillating/amorphously radiating in and from disparate ready-made quantum cavities as they were provisionally once depicted 50–100 years ago. It is true that spectroscopical observations soon necessitated inside arrangements but (the neighbourhood versions of) the established algorithms governed the re, too, to quark and their orbits, partial charges and masses, fluxing gluons and so on.

The resulting inconsistencies are large and profound and actually the pragmatic impulse and reason; the effective white spot for Professor Santilli's exploration, in this case the chemical aspect of the panorama. And here I think we need to ask also ourselves as readers: are we yet true scientists, open-minded, bold, curious as our vocation prescribes? Do we still delight in breaking new grounds—and taboos, above all those founded on superstition or prejudice or routine?

Refreshed blood, moreover, is getting a survival condition for scholarly Science, left astern by industrial and military research in a situation when bright young Chemistry as well as Physics graduates rather seek their fortune there or on Wall Street than join the increasingly ecclesiastical promotion ladders at dogmatically inveterate Academia. Indeed, given sufficient talent, there is nothing to stop the endeavor that Professor Santilli has undertaken. On the contrary, the

facultative merit of his findings is that they are not only compatible with, but contributing to Quantum Chemistry and Mechanics, filling vital gaps that just lie beyond the definitions of these at a domain where they simply do not comply.

Professor Santilli initially identifies some of the major Quantum Chemistry shortcomings which can be resolved by his structural generalisation—covering under the name of "Hadronic Mechanics and Chemistry":

- (1) lack of exact representation of molecular data (on binding energies of the order of 2%, and bigger deviations for electric and magnetic moments which are at time wrong even in their sign);
- (2) inability to permit accurate thermochemical calculations;
- (3) the absence of an attractive valence force sufficiently strong to explain the strength of molecular bonds actually existing;
- (4) the inability to restrict valence bonds to electron pairs only;
- (5) the prediction that all molecules are paramagnetic;
- (6) and others

This accomplishment originates from the deduction that, unlike in local, linear and potential Quantum Mechanics and Chemistry, the novel "Santilli valence force" is non-linear (in the wavefunction), non-local-integral (over a volume), and of contact-non-potential type due to the deep overlapping of the wavepackets of valence electrons in singlet coupling. It is based on a new Mathematics, today known as "Santilli Isomathematics", with invariant real-valued, nowhere singular, yet arbitrary integro-differential units at all levels, from numbers to Schroedinger equations. The representation thus assures the invariance of the theory.

In short, he sets dynamics into realisation by isotopic operators not only enabling running transforms of conventional theories but also exposition of hidden variables, a generalization of Bell's inequality and a completion of Quantum Mechanics and Chemistry much along the celebrated argument by Einstein, Podolsky and Rosen of 1935. The "catastrophic inconsistencies of conventional Mathematics" in these and other respects are reviewed, including lack of invariance in time of basic units and numerical values with consequential lack of applicability to measurements, absence of preservation of Hermiticity with consequential absence of observables, violation of causality and probability laws as well as the basic axioms of Special Relativity. The elimination of such defects by Santilli's Isomathematics should be most instructive reading for all true scientists. The new methods are specifically described for the study of molecular structures conceived as reversible systems isolated from the rest of the universe with Hamiltonian and non-Hamiltonian internal effects, and are presented as part of the "isotopic branch of Quantum Mechanics and Chemistry".

In addition, the first known invariant formulation of irreversibility at any level, from classical to operator systems is presented, founded upon Lagrange's and Hamilton's legacy of representing irreversibility by the reintroduction of those external terms in their celebrated equations which have otherwise been removed from the analysis throughout virtually the entire 20th century. By stating the retrieved "true analytic equations" in a corresponding form, Professor Santilli establishes a Lie-admissible structure in the sense of the American mathematician A. A. Albert. This is then extended from the classical to all subsequent levels of treatment, including quantisation and operator formulations. In this way irreversibility emerges as originating from the most elementary levels of nature (such as protons and electrons in the core of a star), thereby demonstrating the known impossibility of reducing a macroscopic irreversible classical system into a finite collection of elementary particles, each of which, as in Quantum Mechanics, is postulated to be in reversible condition.

Here, an additional new mathematics enters the exposition, today known as "Santilli Genomathematics" and characterised by two real-valued and nonsingular, yet nonsymmetric, generalized dynamic units interconnected by Hermitean conjugations, one of which is designated to move forward in time and the other to move backward in time. The differences between these basic units then guarantees irreversibility for all other reversible Hamiltonians. By recalling that all known potential interactions are strictly reversible, these nonsymmetric generalized units (known as "Santilli genounits") represent the interactions responsible for irreversibility, namely, Lagrange's and Hamilton's external terms, and are especially exemplified in the monograph as part of the "genotopic branch of Hadronic Mechanics and Chemistry" for an invariant representation of open irreversible processes, such as chemical reactions.

The book continues with an account of a third extended generalisation-covering Quantum Mechanics and Chemistry based on an even more general new Mathematics, today known under the name of "Santilli Hypermathematics," which is characterised by "multi-valued", real, non-singular and non-symmetric generalised units at all levels of study.

The need for the further generalization is shown by the concrete example of growth in time of sea shells where the single-valuedness of genotopic formulations does not assure the invariant treatment of the irreversibility of biological systems. This third method is hence presented in the monograph as being specifically applicable to these (but also to other branches of Science, e.g. Cosmology).

The powerful theories get equally strong confirmation and harvest by the exciting discovery and extraction of a new, remarkably corresponding chemical species named "MagneCules", in which atoms are bonded together into stable clusters by internal attractive forces due to the magnetic and electric polarization of their orbitals. Impressive experimental data supporting the existence and properties of Santilli's MagneCules are given.

Finally, and crowning the preceding ground achievements, Santilli describes the application of the new methods and the chemical species of MagneCules to the industrial production of a new fuel he calls "MagneGas"<sup>TM</sup> and whose combustion exhaust is so clean that it has been certified that it does not require catalytic converters.

The monograph proves the viewpoint repeatedly expressed by Santilli in his works, that there cannot be really new scientific theories without really new Mathematics, and there cannot be really new Mathematics without new, and active numbers. However, there is a mutual objective study and analysis of rendered Nature, which remains the firm and unquestionable basis and where, therefore, in their proper generating, assisting and interpretative powers, "the newer concepts in mathematics" are neither the "servants" nor the "masters" [ 1 ] but the equals. Seeing that a formula does the job spurs considerations on the phenomenon exhibiting such behaviour. But it is the patient and reflective observations and explorations of Reality that conducts the designated mind to the appropriate Mathematics. That Professor Santilli, repeatedly nominated for the Nobel Prize, is extremely well equipped and capable to both ends is amply documented, first and foremost by his work, but also by the biographic and bibliographic sections of the monograph which deserve to be briefly summarised as well.

He proposed Hadronic Mechanics already in 1978 jointly with its basic Lie-admissible structure when he was at Harvard University under US Department of Energy support. The study was continued by mathematicians, theoreticians and experimentalists too numerous to quote here (but included in the book's references). However, Santilli remains to this day the most active contributor, eventually bringing the venture to full mathematical maturity in 1996, physical maturity in 1997 and geometric maturity in 1998. Among the main contributors to the novel

Hadronic Chemistry also the Physicists A.O.E. Animalu (co-work and verification on Cooper pair model) and A.K. Aringazin et al. (validation of the new Magnecule species and Chemistry), and the chemist D.D.S. Shillady (co-work on new molecular model) are prominent. No doubt many more will follow when rich, solid, convincing evidence and revenues are now accumulating of the greatest importance for Mankind in evermore desperate need of clean energies and enhanced understanding of the world.

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## References

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3. Noel E. editor. Le matin des mathématiciens—Entretiens sur l'histoire des mathématiques présentés par Emile Noel. Paris: Edition Belin—Radio France, 1985.
4. Lie MS. Over en classe geometriske transformationer. Doctoral Dissertation, Christiania (now Oslo), 1871.
5. E. Trell, Marius Sophus Lie's doctoral thesis over en classe geometriske transformationer. *Algebras Groups Geom* **15** (1998), pp. 395–445.



Practitioner's Docket No. 3293.004A

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Ruggero M. Santilli )  
Application No.: 09/826,183 ) Group No.: 1714  
Filed: 04/04/2001 ) Examiner: C. D. Toomer  
For: NEW CHEMICAL SPECIES OF CLUSTERS )

**DECLARATION UNDER 37 CFR 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Jeremy Dunning-Davies, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it related to the principles embodied in the new chemical species of clusters.
2. My curriculum vitae is attached herein.
3. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. I note that the Examiner alleges essentially that the chemical species invented by Dr. Santilli is not accepted by the scientific community, as contrary to chemistry as is known to date. In order to provide evidence of acceptability by the scientific community, I provide the following comments concerning my independent observation of the invention claimed by Dr. Santilli and/or my understanding of the new species of clusters.

4. Unfortunately, much of today's science seems to be being hampered by what may only be described as 'conventional wisdom'. How something becomes part of this is not immediately clear although there are indications that being part of a 'club' is a help. One part of 'conventional wisdom' is traditional quantum mechanics. However, quantum mechanics itself attracts two views; (i) in its present form, it is the answer to everything, and (ii) it is incomplete. Einstein was one of those to hold the second view. Professor Santilli's life's work has been devoted to attempting a 'completion' of quantum mechanics. Hence, his work does not conform to the dictats of scientific 'conventional wisdom'. It follows that many statements in the Claim Rejections might, not unreasonably, be termed inadmissible because they are made on the basis of pure 'conventional wisdom' and depend on the views of people totally addicted to this doctrine. If this is to be the basis for everything, there will be little worthwhile scientific advance in the immediate future.

Specifically:

Page 3; the recognition or verification of a said cluster by the scientific community ; the fact that this is not recorded is totally unsurprising since only a limited number of people are involved with Professor Santilli and many are opposed to his suggestions simply because they do not uphold 'conventional wisdom'.

Page 5; (2) the nature of the invention; many in the scientific community may hold a belief, and hold it honestly, but that doesn't mean that belief is true fact.

(3) the state of the prior art; a totally irrelevant section since this is, as far as I know, the first time these ideas have been put forward.

Page 6; these arguments are of dubious worth. What is a skilled artisan? Someone may be a good experimentalist but it wouldn't necessarily follow that they could carry out any procedure

without difficulty. Also, if the details of Professor Santilli's procedures were well-known, there would be no need to apply for a patent as all the information would already be in the public domain! The arguments on this page are all very similar and, in my view, revolve around the above point which, as I have said already, is of dubious validity.

Page 7; This is a new area. Not all the processes are fully understood; that is, and must be, the nature of truly fundamental research. However, as is shown in recent publications going back to Professor Santilli's book 'Hadronic Chemistry' and coming to his recent paper 'A new gaseous and combustible form of water', real progress is being made and should be protected.

Page 8; No. I agree that a 'patent is not a hunting license' but, in this particular area, an enormous amount has been achieved in a very short space of time. The person involved deserves protection for his truly fundamental work. Unfortunately, in this day and age of unscrupulous people, that protection may be afforded only by a patent. In my view, this body of work must be so protected. If the examiners for this claim look through some of the outcomes and, more importantly, the possible outcomes of this area of work - see the book Hadronic Chemistry or the article 'The Physics of New Clean Energies and Fuels According to Hadronic Mechanics' (Journal of New Energy, vol. 4, no. 1, 1999) - they may gain some idea of the potential in this work and recognize the very real need for its immediate protection.

In conclusion, I have to state categorically that I feel very strongly that this whole body of work must be protected by the granting of a patent. I admit that, at this stage, no-one knows exactly how much will come out of the work but the potential is there and that potential is enormous.

Dated: 19<sup>th</sup> June, 2006

Jeremy Dunning-Davies

Declarant -

Jeremy Dunning-Davies



## CURRICULUM VITAE.

**Name.** Jeremy Dunning-Davies

**Address.** 117, Fairfield Avenue,  
Kirk Ella, East Yorkshire.  
HU10 7UN.  
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**Nationality.** British.

**Date of Birth.** 21 - 1 - 41.

**Marital Status.** Married to Leona Faith (née Walker)

**Children.** Jonathan Piers born 10 - 10 - 78.  
Bryony Mary born 6 - 6 - 82.

**Education.** 1951-59 Barry Boys' Grammar School,  
Barry, Glamorgan.  
1959-63 Liverpool University.  
1963-66 University College, Cardiff.

**Qualifications.** 1962 - B.Sc. Mathematics, Class II(2), Liverpool.  
1963 - Certificate in Education, Liverpool.  
1966 - Ph.D. for thesis entitled  
"The ideal relativistic quantum gas"  
(University of Wales).

**Positions.** 1966-1968 Assistant Lecturer in Applied Mathematics.  
1968-1981 Lecturer in Applied Mathematics.  
1981-2002 Senior Lecturer in Applied Mathematics.  
2002- Senior Lecturer in Physics.  
(All posts held at Hull University)

## Research Interests.

Having been a research student of Peter Landsberg at University College, Cardiff, it is not surprising that I should develop a deep and lasting interest in Thermodynamics. However, initially, my research was concerned with studying the statistical thermodynamics of the ideal relativistic quantum gases and it was this study which led to the award of my Ph.D. As may be seen from the attached list of publications, this study also led to several articles in the period 1966 - 68. Some general results concerning particle-number fluctuations also originated in this study of the ideal quantum gases and provided material for further publications. In the 1980's, attention again focussed on the ideal Bose-Einstein gas, - the interest being reawakened by the exploration, at that time, of the cosmological implications of a massive primordial photon gas and by the increased attention being paid to problems associated with quarks and quark confinement. Since the first paper to discuss ideal relativistic Bose condensation was by Peter Landsberg and myself, it seemed natural for us to collaborate on a further study of the Bose gases. The work eventually resulted in Peter Landsberg presenting an invited paper to the International Symposium on the Statistical Mechanics of Quarks and Hadrons at Bielfeld in August 1980 and in my writing two more articles. Far more recently, Peter Landsberg and I have looked, with the help of my research student, David Pollard, at the statistical thermodynamic problems associated with a column of ideal gas acted on by gravity. This investigation has led to a longish publication and has helped towards the award of a Ph.D. to David Pollard.

As far as classical thermodynamics is concerned, I became interested in the analytical approach to the subject initiated by Carathéodory in 1909 but revised and simplified by such as Turner, Buchdahl and Landsberg himself. My contribution has been concerned with the connection between the various forms of the Second Law of Thermodynamics and investigating the possible link between the Second and Third Laws. I have also been interested in negative absolute temperatures and particularly in the possibility of running Carnot cycles when one, or both, of the heat reservoirs have negative absolute temperatures.

My main area of research in recent years has involved collaboration with Bernard Lavenda of the University of Camerino in Italy on a wide variety of problems in Thermodynamics and Statistical Thermodynamics. Initially, we worked on a probabilistic approach to thermodynamics and showed that physical statistics may be derived from error laws belonging to exponential families of distributions. Instead of using Boltzmann's principle to relate the entropy to what is called the "thermodynamic" probability, we found that the entropy determines the form of the error law. Where Stirling's approximation is applicable, the probability distribution is a function of the difference between the entropy and its maximum value at equilibrium for which the average and most probable values coincide. We have used this approach to establish that there are no intermediate statistics between the well-known Fermi and Bose statistics which are governed by the binomial and negative binomial distributions respectively. The work has continued over a number of years now and, as the publications list shows, the technique may be applied to a wide range of topics. Again, as the publications list shows, my interest in the Second Law of Thermodynamics has remained and this more recent work has reinforced the tremendously wide-ranging importance of this Law. Unfortunately, the work has also highlighted the lack of appreciation of this importance exhibited by some people. This has led to some publications but also to the deliberate blockage of the publication of a number of interesting, and possibly important, results; this has been especially noticeable in the area of astrophysics - particularly results associated with black holes! The collaboration with Professor Lavenda has resulted also in my travelling to Italy to be the speaker for two research seminars at the University of Camerino.

More recently, I have been collaborating with Prof. G.H.A.Cole of the Department of Engineering Design and Manufacture. We are interested in a wide range of problems in such areas as thermodynamics (especially ideas concerning entropy), astrophysics and relativity (even time travel has come in for discussion as is seen from the publications list). Our discussions led to my delivering an extremely well-received paper entitled "Qualms concerning relativity theory and some of its applications" at an international meeting on the Physical Interpretations of Relativity Theory held at Imperial College, London in September, 1996. This talk led to a publication on the same topic which is listed. Our discussions have led to other publications and to several articles being assessed at present by journals. More recently, our collaboration has led to my delivering another well-received paper entitled "Past and present states of superdense matter" at this September's meeting on the Physical

Interpretations of Relativity Theory, again held at Imperial College. This talk has also led to a related publication in the Russian journal "Gravitation", a publication which will appear separately in both Russian and English. The work is still progressing smoothly and ideas on entropy are being clarified. I might comment in passing that, at both the above mentioned meetings, my lectures were so well received by people from all parts of the world that their appreciation was audibly expressed in the lecture theatre. This must have been beneficial for Hull University!

At the above mentioned meeting in 1996, I met Professor R.M.Santilli, Director of the Institute for Basic Research in Florida. At my suggestion, a new Division of Thermodynamics has been created at the Institute of which I am the head. Also, I have been granted the honorary position of Full Professor in the Institute. It now remains to get the new division working and producing results. However, at the more recent Imperial College meeting, Professor Santilli and I met again and are now engaged in extending thermodynamics to cover the new range of materials presently being produced in Florida. The technology involved in producing these new substances arose from work on the newly discovered fuel, referred to in the literature as "Aquafuel". For reasons of security, I cannot discuss this in too much detail.

Finally, my research student, David Pollard, and I have looked quite closely at problems associated with the possible existence of negative mass and of systems possessing negative heat capacities. All this work has been published and David has gained his Ph.D.

The work in thermodynamics has helped me meet many of the top thermodynamicists in Europe. This group recently formed the European Thermodynamics Network which received funding under the European Commission's Third Framework, - gaining fifth place in Chemistry in the Human Capital and Mobility Programme. It might be mentioned also that this work on thermodynamics and related topics has produced much appreciative reaction from all around the world and has resulted in my being invited to participate in collaborative research with a wide range of international colleagues, the most recent request coming from Professor Erik Trell of Linköping University, Sweden, with whom I am collaborating on a translation of the original doctoral thesis of Marius Sophus Lie.

I have also collaborated with colleagues within the University of Hull. I did a little work with Mati Choudhury of my own department on a problem in the field of atomic physics. This formed the subject of a lengthy article and of a paper read by Mati at the Quantum Theory Conference held at York in 1971. Due to my friendship with Bill Stephenson of the Department of Electronic Engineering, I became interested in various problems in the field of active filter circuits. This work resulted in a number of articles, the ones concerned with active filters containing current conveyors involving work undertaken after Bill Stephenson left Hull to take up an appointment at the Virginia Polytechnic and State University at Blacksburg. Since Bill Stephenson left, I have collaborated with Jack Sewell of the Electronic Engineering Department on problems associated with active equivalent network theory. This work led to two articles and appears to have helped open up a relatively new area of theoretical investigation in electronics.

I believe collaborative research between people in different departments is good for the individuals concerned, for the departments and, ultimately, for the University itself. Such collaboration need not lead necessarily to publications by the mathematician involved but it can lead to a deeper understanding of the process involved. Members of mathematics departments can provide a useful service to colleagues in other departments by simply helping with the mathematics encountered. From time to time, I have been involved in this way with Bill Armstrong of the Biology Department.

Finally, another interest of mine is education, particularly mathematical education, and this has led to the few general articles I have written. This interest in education has led also to my involvement with the Science Experience Group at Hull University. This group aims to raise the profile of science in the region and, to this end, organises Saturday morning lectures for schoolchildren and their parents, outings for the same people to such places as Jodrell Bank, and runs a science week at the University as well as science roadshows which visit various venues in Yorkshire. In the science week, such activities as choosing Young Scientists of the Year from the area's schools and running a science project competition for schools also take place. This activity on my part led to my giving a public lecture to schoolchildren and their parents entitled "Space, Time and All That". This seemed to be well received and appeared as a Mathematics Research Report. I have more recently had an article, "Some thoughts

on higher education", published in The Individual and have appeared on several radio programmes, both national and local, discussing present day sixth form education and A-levels in particular.

## Teaching and Administrative Duties.

Since coming to Hull, I have been concerned with teaching mathematics students in all three years of the degree course, having, at one time or another, taught

- (1) First year courses in "Vector Mechanics" and "Mathematical Methods" (vector algebra, vector calculus, functions of several variables)
- (2) Second year courses in "Rigid Body and Analytical Mechanics", "Mathematical Methods" (Fourier series, Laplace transforms, series solutions of ordinary differential equations, partial differential equations, special functions) and a one-term course on "Variational Methods"
- (3) Third year course in "Special and General Relativity", "Thermodynamics" (one term), and "Statistical Thermodynamics" (two terms)

Also, I have given a third year course on "Thermodynamics" to the final year Mathematics students and, as a direct result of that, I have written a text "*Concise Thermodynamics*", which was published by Albion Publishing Ltd. in 1996. This book contains a complete undergraduate lecture course - based on the lectures I have given here at Hull - before proceeding to use this basic theory to discuss a number of topics at the forefront of present research. It is possibly of interest to note that, during the five years that this course ran, the average grade achieved by the students was a middle II.1, but, having read my book, an Oxford University Professor of Physics, while liking it, felt it too difficult for his students!

At the present time, I am giving a third/fourth year course on Advanced Mechanics and, last year, gave a similar level course on Electromagnetism, - a return to this topic after roughly thirty years. As far as the electromagnetism course was concerned, Dr. R.D.Greenough (Applied Physics) and I, after consultation with the students involved, organised a session of demonstration experiments to illustrate the most important laws of the subject. This was to make the students, who had little or no physics background, aware of the experimental nature of the basis of the subject. This approach was welcomed by the students who responded in June with an excellent set of examination performances. At present, Dr.Greenough and I are engaged in compiling notes on this.

In addition, as far as Mathematics students are concerned, I have given M.Sc. lecture courses on "Statistical Thermodynamics with Applications" and "Reversible and Irreversible Thermodynamics".

Again, the Applied Mathematics Department has become more and more involved with the teaching of mathematics to students in other departments - Applied Physics, Electronic Engineering, Engineering Design and Manufacture. These departments now have mathematics courses taught as integral parts of their degrees, rather than as ancillary subjects. I myself was closely involved with the original setting up of the courses given to students in Electronic Engineering, Engineering design and Manufacture and Applied Physics. Also, I have taught the second year course for students in these departments and, at present, I am teaching the second year course for students in Applied Physics and E.D.M.

As a direct result of this involvement with service teaching, I wrote the book

"*Mathematical Methods for Mathematicians, Physical Scientists and Engineers*"

which was published by Ellis Horwood in 1982. This book is based on the material which was taught to the Electronic Engineering students at Hull at that time and, indeed, on that taught to our full-time Mathematics students.

I feel that the giving of service courses , such as those mentioned, is an important part of the role of a Mathematics Department in a University. Indeed, it is as important as the teaching of Mathematics students and can be more rewarding. I feel also that the way in which the above mentioned courses were set up in Hull is correct; - the course content was agreed jointly by the Applied Mathematics and the user departments; the Applied mathematicians were left to teach the material and set work, with the possibility of the user department supplying some questions for homework.

As far as administrative duties are concerned, my main duty until recently has been to deal with questions concerning examination returns and to assist with the organisation of the examinations and examination papers. Also, from 1968 to 1990, I was responsible for compiling the mark sheets for our final year honours students for the final examiners' meeting. However, in 1990, I became Chairman of the Board of Examiners for the School of Mathematics. After six years in this post, I have now stepped down. In addition, I have been deputy selector for the mathematics departments for two years and subsequently selector for two years. I have served on the Staff-Student committee on several occasions; have served as a member of the Board of the Faculty of Science on two occasions; and have been a representative of the Science lecturing staff on Senate.

Until leaving mathematics, I was engaged with three administrative tasks within the department. Firstly, I was in charge of examinations again. This involved ensuring that all exam. papers were set and vetted before being sent to the external examiner; and seeing that master copies of these were in the hands of the exams. office as close to the required date as possible. Also, I acted as library rep. for the department, dealing with all orders and keeping a check on the finances - in these days of increasing journal prices and decreasing funding, this latter task was certainly not a trivial one and was one which, on occasions consumed considerable time. Finally, I was the departmental safety officer. This was not been an onerous job but, with the increased profile of Health and Safety, this was likely to change. Indeed I compiled a Health and Safety policy document for the department, which was well received.

Again, when the taught M.Sc. courses were running in Hull, I supervised several of the students. Since then I have supervised a student for three years on a Ph.D. project concerned with laser produced plasmas. (The student went on to do further work with Professor Pert in the Applied Physics department before writing up successfully.) More recently, I have been supervising a student on a Ph.D. project concerned with problems in statistical thermodynamics. This student, David Pollard, wrote up successfully and received his doctorate in December 1995.

It is undoubtedly the case that science is becoming less and less popular in schools and this is obviously having an effect on university science departments who are finding it more and more difficult to fill their places. This university is attempting to awaken some interest in science among school children of the region by running a science competition - the Starship Project. I have been involved with this almost from the start and will continue with this involvement until it is finished. Also, in this general area of helping promote science in schools, I am helping organise a meeting - possibly in September or October for either a whole day or a half-day - in which the need for girls to study physics will be emphasised. This will be run for all interested schools in the area with help from Hull High School for Girls and indeed, a colleague from the Physics Department and have run a short meeting for that school's present year 9 in the hope of encouraging some of those girls to continue studying physics. I should point out, perhaps, that I have been invited to organise these events by the Headmistress of Hull High School for Girls since she and some of her colleagues in other schools are extremely concerned about the position of physics in girls' schools.

Since coming to Hull, I have tried to take a full interest in all the main University functions and have acted as an assistant marshal at Degree Congregations, Founders' Days and Annual Meetings of Court. I have also acted as marshal on a number of occasions at Degree Congregations.

Outside the University, I referee articles for Journal of Physics A, Physics Essays, Physical Review, Physical Review Letters, Journal of Mathematical Physics, Physics Letters A, American Journal of Physics, Zeitschrift fur Naturforschung A and Electronics Letters. I also referee books for Albion Publishing Ltd. Finally, I have accepted an invitation to act as a referee for applications received in the Scientific Affairs Division of Nato for support under the Nato Scientific Exchange Programme.

## Publications.

### **Thermodynamics/Statistical Thermodynamics.**

1. "Statistical thermodynamics of the ideal relativistic quantum gas"  
in Statistical Mechanics of Equilibrium and Non-equilibrium,  
ed. J.Meixner; (North-Holland, Amsterdam, 1965).  
(With P.T.Landsberg)
2. "Ideal relativistic Bose condensation"  
*Phys. Rev.* **138** (1965) A1049  
(with P.T.Landsberg)
3. "Carathéodory's principle and the Kelvin statement of the second law"  
*Nature* **208** (1968) 576
4. "A consequence of the Gibbs-Duhem relation"  
*Il Nuovo Cimento* **53B** (1968) 180
5. "Particle-number fluctuations"  
*Il Nuovo Cimento* **57B** (1968) 315
6. "Connections between the various forms of the second law of thermodynamics"  
*Il Nuovo Cimento* **64B** (1969) 82
7. "The second law and adiabatic unattainability"  
*Il Nuovo Cimento* **10B** (1972) 407
8. "Negative absolute temperatures and Carnot cycles"  
*J.Phys.A* **9** (1976) 605
9. "Remarks on negative absolute temperatures and Carnot cycles"  
*Am. J. Phys.* **46** (1978) 583
10. "A comment on the ideal relativistic Bose gas"  
*J. Phys. A* **14** (1981) 3013
11. "The d-dimensional Landsberg gas"  
*J. Phys. A* **14** (1981) 3005
12. "On the meaning of extensivity"  
*Phys. Lett.* **94A** (1983) 346
13. "On the derivation of  $dQ = TdS$ "  
*J. Phys. A* **16** (1983) 3377
14. "Extensivity and the Gibbs-Duhem equation"  
*Phys. Lett.* **97A** (1983) 327
15. "A note on the laws of thermodynamics"  
*Il Nuovo Cimento* **83B** (1984) 88
16. "Logical relations among different definitions of extensivity"  
*Phys. Lett.* **107A** (1985) 383  
(with P.T.Landsberg)

17. "A note on the gamma function for the unary"  
Euro. J. Phys. **7** (1986) 160
18. "Problems of non-extensivity in hadron thermodynamics"  
J. Stat. Phys. **46** (1987) 87  
(with P.T.Landsberg)
19. "Thermodynamics of non-extensive systems"  
J. Phys. Chem. Solids **49** (1988) 705
20. "On the law of error for mass fluctuations in black holes"  
Classical & Quantum Gravity **5** (1988) L149  
(with B.H.Lavenda)
21. "The case against intermediate statistics"  
J. Math. Phys. **30** (1989) 1117  
(with B.H.Lavenda)
22. "On the analogy between first-order phase transitions and black body radiation"  
Found. Phys. Lett. **2** (1989) 251  
(with B.H.Lavenda)
23. "Classical particles and order statistics"  
Phys. Lett. **140A** (1989) 90  
(with B.H.Lavenda)
24. "Stefan-Boltzmann law for black bodies and black holes"  
Int. J. Theor. Phys. **29** (1990) 501  
(with B.H.Lavenda)
25. "Underlying probability distributions of the canonical ensemble"  
Int. J. Theor. Phys. **29** (1990) 85  
(with B.H.Lavenda)
26. "Kinetic derivation of Gauss' law and its thermodynamic significance"  
Z. Fur Naturforschung **45a** (1990) 873  
(with B.H.Lavenda)
27. "The essence of the second law is concavity"  
Found. Phys. Lett. **3** (1990) 435  
(with B.H.Lavenda)
28. "Probability distributions of thermodynamic intensive variables"  
Int. J. Theor. Phys. **30** (1991) 907  
(with B.H.Lavenda)
29. "Qualms concerning the inflationary scenario"  
Found. Phys. Lett. **5** (1992) 191  
(with B.H.Lavenda)
30. "Concavity, superadditivity and the second law"  
Found. Phys. Lett. **6** (1993) 289
31. "Comment on 'The Hawking Phenomenon'"  
Public Understand. Sci. **2** (1993) 85
32. "Comment on 'Implications of the entropy maximum principle'"  
Am. J. Phys. **61** (1993) 88

33. "Bosons and fermions in two dimensions"  
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34. "Geothermal energy"  
Phys. Ed. **28** (1993) 343
35. "The second law, concavity and negative heat capacities"  
Trends in Statistical Physics **1** (1994) 233
36. "Elementary errors about entropy"  
Nature **368** (1994) 284
37. "The entropy of a column of gas under gravity"  
Am. J. Phys. **62** (1994) 712  
(with P.T.Landsberg and D. Pollard)
38. "A new thermodynamics for self-gravitating systems"  
Review Bulletin Calcutta Math. Soc. **2** (1994) 1  
(with B.H.Lavenda)
39. "The essence of the third law; the delination of two forms of thermodynamics"  
Il Nuovo Cimento **110B** (1995) 265  
(with B.H.Lavenda)
40. "What is entropy?"  
Il Nuovo Cimento **110B** (1995) 433  
(with B.H.Lavenda and M.Compiani)
41. "A consideration of the possibility of negative mass"  
Il Nuovo Cimento **110B** (1995) 857  
(with D.Pollard)
42. "Questions concerning relativity theory and some of its applications"  
Hadronic Journal **19** (1996) 543  
(with G.H.A.Cole)
43. "Time travel; fact or fiction?"  
Hadronic Journal **20** (1997) 317  
(with G.H.A.Cole)
44. "The prospects for time travel"  
The Observatory, June 1997.  
(with G.H.A.Cole)
45. "Undergraduate thermodynamics and black holes"  
European J. Phys. **18** (1997) 267
46. "Beyond a Neutron Star?"  
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(with G.H.A.Cole)
47. "Qualms concerning relativity theory and some of its applications"  
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48. "Problems with the entropy concept in modern applications of thermodynamics"  
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50. "Degeneracy in Astrophysics"  
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51. "Describing states of super-dense matter"  
Physical Interpretations of Relativity Theory, 1998, pp.84-93
52. "Strings and Inflation in Modern Cosmology"  
Hadronic Journal 22 (1999) 117.
53. "Intermediate Statistics?"  
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54. "Past and present states of super-dense matter"  
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(with G.H.A.Cole)
55. "Thermodynamics of antimatter via Santilli's isodualities"  
Foundations of Physics Letters 12 (1999) 593-599.
56. "Open, closed and isolated systems"  
Hadronic Journal 22 (1999) 489.  
(with G.H.A.Cole)
57. "Thermodynamics of antimatter via Santilli's isodualities"  
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58. "Entropy, Thermodynamics and Biology"  
Hadronic Journal 24 (2001) 1 - 10.
59. "Thermodynamics: The Second Law Revisited"  
Hadronic Journal 24 (2001) 11 - 16.  
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60. "Qualms Concerning Relativity Theory"  
*Recent Advances in Relativity Theory*, vol 2 - Material Interpretations,  
Eds. M.C.Duffy & M. Wegener, (Hadronic Press, Palm Harbor, U.S.A., 2001)  
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61. "Stirling's approximation: to use or not to use"  
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62. "Maxwell's electromagnetic equations revisited"  
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63. Book review of "Foundations of Hadronic Chemistry with Applications to  
New Clean Energies and Fuels" by R.M.Santilli,  
Foundations of Physics 32 (2002) 1175-1178
64. "Concavity and the Second Law of Thermodynamics"  
Int. J. Math. Ed. in Sci. & Tech. 34 (2003) 627 - 629

65. "Nuclear Power and the World's Energy Requirements"  
Progress in Energy (accepted)  
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66. "Universal Constants and Black Holes"  
Focus on Astrophysics Research , (ed. Louis V. Ross), 2003, pp.73-83.
67. "X-ray vision"  
Letter to National Geographic, April 2003.
68. "The possible variation of the universal constant of gravitation with time"  
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(with D. Elrick)
69. "Qualms regarding "Superstatistics" by C. Beck and E. G. D. Cohen,  
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70. "Qualms regarding "Non-extensive Hamilton systems follow Boltzmann's principle not Tsallis statistics-phase transitions, second law of Thermodynamics" by D. H. E. Gross,  
Physica A 305 (2002) 99  
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71. "Additive entropies of degree-q and the Tsallis entropy"  
<http://uk.arXiv.org> physics/0310117  
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72. "Qualms concerning Tsallis's condition of Pseudo-Additivity as a Definition of Non-Extensivity"  
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73. "Qualms concerning Tsallis's use of the maximum entropy formalism"  
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74. "Qualms regarding "Dynamical Foundations of Nonextensive Statistical Mechanics" by C. Beck  
<http://uk.arXiv.org> cond-mat/0312301  
(with B.H.Lavenda)
75. "Results concerning the centre of our galaxy"  
<http://uk.arXiv.org> astro-ph/0402290
76. "E. A. Milne and the Universes of Newton and Relativistic Cosmology"  
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77. "The Gravitational Red-Shift"  
<http://uk.arXiv.org> gr-qc/0403082  
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78. "Some comments on the Theory of Bose Condensation, with particular reference to the Interiors of Stars"  
<http://uk.arXiv.org> physics/0405139
79. "Hadron thermodynamics, concavity and negative heat capacities"  
<http://uk.arXiv.org> physics/0406041

80. "A re-examination of Maxwell's electromagnetic equations"  
<http://uk.arXiv.org/physics/0406056>
81. "The constancy, or otherwise, of the speed of light"  
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82. "On the existence of statistics intermediate between those of Fermi-Dirac and Bose-Einstein"  
<http://uk.arXiv.org/physics/0407081>
83. "Some Comments on the Universal Constants"  
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84. "Finding evidence for black holes"  
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85. "Pseudo-additive entropies of degree-q and the Tsallis entropy"  
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87. "Are 'Superstatistics' and 'Nonextensive Statistical Mechanics' Viable?"  
Journal of Applied Sciences 5 (5), (2005) 928-937  
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88. "Astronomy Education"  
The Observatory 125 no. 1184 (2005) 43
89. "Is 'superstatistics' really 'super'?"  
<http://uk.arXiv.org/physics/0502153>
90. "Questions Concerning Schwarzschild's Solution of Einstein's Equations"  
<http://uk.arXiv.org/physics/0503095>
91. "Some comments on extreme value statistics"  
<http://uk.arXiv.org/physics/0503134>
92. "Twentieth century physics; promised much, delivered...?"  
Volume in commemoration of Ruggero Santilli's 70<sup>th</sup> birthday.
93. "Black holes, other exotic stars and conventional wisdom"  
Apeiron 12 (2005) 291-308.  
(with S.E.Bloomer)
94. "Schwarzschild's Solution, Black Holes and the Universal Constants"  
Hadronic Journal (to appear)
95. "Planck particles and quantum gravity"  
Progress in Physics 1(2006)70-73  
(with S. J. Crothers)
96. 'The thermodynamics associated with Santilli's hadronic mechanics'

**Atomic Physics.**

"Pressure shifts of high-series spectral lines and cross sections for scattering of very slow electrons from rare-gas atoms"  
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(with M.H.Choudhury)

## **Electronic Engineering.**

1. "Analytical realisation of evc-arc networks"  
Elec. Lett. **10** (1974) 103  
(with F.W.Stephenson)
2. "Optimised RC-NIC bandpass structures"  
Int. J. Electronics **37** (1974) 289  
(with F.W.Stephenson)
3. "4th order evc-arc networks"  
Int. J. Electronics **37** (1974) 715  
(with F.W.Stephenson)
4. "The equivalence of third-order low-pass structures"  
Proc. I.E.E.E. **63** (1975) 319  
(with F.W.Stephenson)
5. "The application of capacitance minimisation to low-pass active RC structures"  
Elec. Lett. **11** (1975) 198  
(with F.W.Stephenson)
6. "Recursive formulae for the analysis of double-ladder single amplifier feedback systems"  
Int. J. Electronics **39** (1975) 625  
(with F.W.Stephenson)
7. "Canonically-extended evc-arc networks and their associated recursive formulae"  
Int. J. Electronics **40** (1976) 329  
(with F.W.Stephenson)
8. "Notes on the solution of evc-arc network equations"  
Int. J. Electronics **40** (1976) 305
9. "Sensitivity comparison of low-pass RC structures"  
Proc. I.E.E.E. **65** (1977) 488  
(with F.W.Stephenson)
10. "Comment on: Active realisation of a third-order bandpass Butterworth characteristic using equal-valued passive elements"  
Elec. Lett. **13** (1977) 34  
(with F.W.Stephenson)
11. "On sensitivity theorems in active equivalent network theory"  
Proceedings of the 1978 I.E.E.E. International Symposium on Circuits and Systems,  
New York, May, 1978, pp 1060-1063  
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12. "Some further sensitivity theorems in active equivalent network theory"  
I.E.E.J.Elec. Circuits and Syst. **2** (1978) 193  
(with F.D.Faulkner and J.I.Sewell)
13. "Analytical optimisation of equal-value-capacitor active RC networks"  
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(with F.W.Stephenson)

14. "Simplified design procedures for a third-order system using current conveyors"  
Elec. Lett. **15** (1979) 215  
(with F.W.Stephenson)
15. "Sensitivity optimisation of active filters containing current conveyors and controlled sources"  
Proceedings of Southeastcon. pp 202, 1980, Nashville Tennessee  
(with F.W.Stephenson)
16. "Sensitivity optimisation of active filters containing current conveyors and controlled sources"  
Int. J. Electronics **48** (1980) 283  
(with F.W.Stephenson)

## **General.**

1. "Student representation on university senates - the case against"  
Times Higher Ed. Supp. No. 34, 2nd June 1972, p 13  
(with F.W.Stephenson)
2. "A survey of student representation on university senates"  
Universities Quarterly, Winter 1972, p 40  
(with D.A.Bell, A.G.Martin and F.W.Stephenson)
3. "Majority - what does it mean?"  
Professional Administration 4 (1974) 4  
(with F.W.Stephenson)
4. "An applied mathematician's comments on modern mathematics syllabuses"  
Mathematics Teaching, no 73, Dec. 1975, p 60
5. "Another ploy to reduce academic standards"  
Times Ed. Supp. No 3163, 16th Jan., 1976, p 18  
(with F.W.Stephenson)
6. "Educationalists"  
Spectator, 29th May, 1976, p 25  
(with F.W.Stephenson)
7. "Some observations on higher education today"  
The Individual, November 1996.
8. The Individual, April 1997.  
Reply to discussion of material in the above mentioned article.
9. Review of 'Re-Pitching the Tent' by Richard Giles,  
(Canterbury Press, 1999)  
Faith and Heritage, no.53, September, 2002.

**Mathematical Research Reports - School of Mathematics.**

1. "On the entropy of black holes"  
(with B.H.Lavenda)
2. "On the theory of second order phase transitions"  
(with B.H.Lavenda)
3. "The case against negative heat capacities"  
(with B.H.Lavenda)
4. "Bose-Einstein condensation: a two phase equilibrium at different pressures"  
(with B.H.Lavenda)
5. "Entropy paradoxes"  
(with B.H.Lavenda)
6. "Probabilistic basis of thermodynamics"  
(with B.H.Lavenda)
7. "Statistical thermodynamics without ensemble theory"  
(with B.H.Lavenda)
8. "Negative temperatures revisited"
9. "Are negative heat capacities allowable?"
10. "Space, Time and All That"

**Books.**

1. "Mathematical methods for mathematicians, physical scientists and engineers"  
(Ellis Horwood, Chichester, 1982)
2. "Concise Thermodynamics: Principles and Applications in Physical Science and Engineering"  
(Albion Publishing Ltd., Chichester, 1996)
3. "Mathematical methods for mathematicians, physical scientists and engineers"  
2<sup>nd</sup> edition, (Horwood Publishing, Chichester, 2003)



Practitioner's Docket No. 3293.004A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ruggero M. Santilli )

Application No.: 09/826,183 )

Group No.: 1714

Filed: 04/04/2001 )

Examiner: C. D. Toomer

For: NEW CHEMICAL SPECIES OF CLUSTERS )

**DECLARATION UNDER 37 CFR 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it related to the principles embodied in the new chemical species of clusters.
  
2. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. I note that the Examiner alleges essentially that the chemical species invented by Dr. Santilli is not accepted by the scientific community, as contrary to chemistry as is known to date. In order to provide evidence of acceptability by the scientific community, I provide the following comments concerning my independent observation of the invention claimed by Dr. Santilli and/or my understanding of the new species of clusters.

3. As a former reactor operator in the US navy nuclear power program, I evaluated Dr. Santilli's claims without reference to the opinions of the US scientific community. In reading Dr. Santilli's book, "Fundamentals of Hadronic Chemistry", I found no conflict between his presentation of sub-atomic processes and the concepts I had already learned. Since the US scientific community is apparently unaware of Dr. Santilli's generalization of Lies's Theory, it is not surprising it should find it difficult to accept a model of atomic structure that differs from the one taught in graduate school.

Dated: 6/20/06

Declarant -

*Ronald B. Cole*

Ronald B. Cole  
Director - Applied Hadronics  
1268 South State Street  
Ukiah CA 95482



Practitioner's Docket No. 3293.004A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ruggero M. Santilli )  
Application No.: 09/826,183 ) Group No.: 1714  
Filed: 04/04/2001 ) Examiner: C. D. Toomer  
For: NEW CHEMICAL SPECIES OF CLUSTERS )

**DECLARATION UNDER 37 CFR 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, DOTT. ING. GIORGIO BEGHELLA BARTOLI, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it related to the principles embodied in the new chemical species of clusters.
2. My curriculum vitae is attached herein.
3. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. I note that the Examiner alleges essentially that the chemical species invented by Dr. Santilli is not accepted by the scientific community, as contrary to chemistry as is known to date. In order to provide evidence of acceptability by the scientific community, I provide the following comments concerning my independent observation of the invention claimed by Dr. Santilli and my understanding of the new species of clusters.



#### 4. COMMENTS IN SUPPORT OF DR. SANTILLI FINDINGS

I and my staff are working to implement here at Monza Circuit, together with other important Italian Companies, the new "Monza Research Institute" based on the new chemical species of Santilli MagneCules, for us the only efficient new chemical bond between gaseous and liquid fossil fuels that produces a major improvement of combustion with consequential major decrease of contaminants in the exhausts (therefore able to produce really clean fuels).

Dated: 4<sup>th</sup> July 2006

**Declarant -**

Ing. Giorgio Beghella Bartoli  




## CURRICULUM VITAE

### DOTT. ING. GIORGIO BEGHELLA BARTOLI

Nato a Ancona, il 18 maggio 1949  
 Residente a MONZA (MI) in Via Leoncavallo, 8  
 CAP 20052  
 Telefono ufficio +39 039 2482246  
 Indirizzo Internet [beghella@monzanet.it](mailto:beghella@monzanet.it)  
 Stato civile coniugato, con un figlio

#### TITOLO DI STUDIO

Laurea di Ingegneria Civile Edile - Specializzazione Trasporti  
 Iscritto all'Albo degli Ingegneri - provincia di Milano n° 11432

#### PRINCIPALI ESPERIENZE PROFESSIONALI

dal 01/02/78	al 30/08/79	<ul style="list-style-type: none"> <li>- Responsabile Ufficio Tecnico della Commissione Sportiva Automobilistica Italiana (CSAI);</li> <li>- Segretario Sottocommissione Tecnica, Sottocommissione Circuiti e Sicurezza, Sottocommissione Fuoristrada.</li> </ul>
dal 01/09/79	al 31/12/82	<ul style="list-style-type: none"> <li>- Direttore sede di Milano dell' Associazione Nazionale fra Industrie Automobilistiche (ANFIA);</li> <li>- Vice Delegato ANFIA all'attività del Consiglio Sportivo Nazionale e del Comitato Esecutivo della CSAI.</li> </ul>
dal 01/01/83		<ul style="list-style-type: none"> <li>- Dirigente dell'Autodromo di Monza con la qualifica di Direttore Tecnico (responsabile Ufficio tecnico, progettazione, sviluppo, impianti).</li> </ul>
Dal 1989	Al 1990	<ul style="list-style-type: none"> <li>- Direttore dei lavori del nuovo edificio box dell'Autodromo di Monza</li> </ul>
Dal 1990		<ul style="list-style-type: none"> <li>- Responsabile Ufficio Studi e Ricerche di Monza.</li> </ul>
Dal 1994		<ul style="list-style-type: none"> <li>- Progettista e Direttore dei lavori di tutte le modifiche alla Pista ed alle installazioni dell'Autodromo di Monza</li> </ul>
Dal 1998	Al 2003	<ul style="list-style-type: none"> <li>- Co-progettista del nuovo edificio servizi dell'Autodromo di Monza</li> <li>- Co-progettista della ristrutturazione e ampliamento dell'edificio box dell'Autodromo di Monza</li> <li>- Direttore dei lavori del nuovo edificio servizi e della ristrutturazione ed ampliamento dell'edificio box dell'Autodromo di Monza</li> </ul>
Dal 1999		<ul style="list-style-type: none"> <li>- Progettista e coordinatore del nuovo Autodromo di Patrasso in Grecia.</li> </ul>
Nel 2001		<ul style="list-style-type: none"> <li>- Co-redattore del Piano di fattibilità del nuovo Autodromo di Catania</li> </ul>
Dal 2004		<ul style="list-style-type: none"> <li>- Co-progettista del nuovo complesso dell'Autodromo di Jin Hua, in Cina, e delle piste per test ed omologazione degli autoveicoli</li> </ul>



**INCARICHI DIRIGENZIALI NAZIONALI NELLA COMMISSIONE SPORTIVA  
AUTOMOBILISTICA ITALIANA (C.S.A.I.)**

Dalla creazione	al 1989	- Membro della Sottocommissione Relazioni Esterne
Da agosto 1980	Dicembre 1997	- Partecipazione alla Sottocommissione Tecnica quale Delegato Italiano alla Commissione Tecnica F.I.A..
Da giugno 1992		- Membro Sottocommissione Circuiti e Sicurezza.
Da dicembre 2000		- Presidente Sottocommissione Circuiti e Sicurezza

**INCARICHI INTERNAZIONALI NELLA F.I.A. (FEDERATION INTERNATIONALE  
DE L'AUTOMOBILE)**

Dal 01/02/78	al 01/08/80	- Delegato CSAI al gruppo di lavoro Omologazioni F.I.A..
Dal 01/08/80	al 01/10/97	- Delegato italiano alla Commissione Tecnica F.I.A..
Per un anno dalla sua creazione		- Delegato italiano alla Commissione Vetture Turismo F.I.A..
Dal 01/10/97	al 01/10/98	- Delegato italiano alla Commissione Circuiti e Sicurezza F.I.A..
		- Partecipazione a diversi Gran Premi F.1 all'estero quale Delegato italiano.

**ATTIVITÀ SPORTIVA**

Dal 1984		- Commissario Sportivo Provinciale dell' A.C. Milano
Dal 1984		- Direttore di Gara Nazionale
Dal 1985		- Direttore di Gara Internazionale
Dal 1991		- Direttore di Gara del Gran Premio d'Italia di F.1

**ATTIVITÀ CENTRO STUDI**

Dal 1991		- Progetto e realizzazione RFID (Radio Frequency Identification)
Dal 1999		- Nuovo asfalto drenante autopulente per circuiti automobilistici
Dal 2004		- Sperimentazione di nuovi carburanti puliti



**DECLARATION**



Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

I, T. Nejat Veziroglu, declare and state:

1. I am a scientific professional who has reviewed the works of Dr. Santilli as it related to the principles embodied in the new chemical species of clusters.
2. My curriculum vitae is attached herein.
3. I have read the Official Action mailed February 13, 2006, and the reasons for rejection noted by the Examiner. I note that the Examiner alleges essentially that the chemical species invented by Dr. Santilli is not accepted by the scientific community, as contrary to chemistry as is known to date. In order to provide evidence of acceptability by the scientific community, I provide the following comments concerning my independent observation of the invention claimed by Dr. Santilli and/or my understanding of the new species of clusters.
4. Dr. Santilli has published his findings in the following papers published in the IJHE (International Journal of Hydrogen Energy) of which I am the Editor-in-Chief:

A new iso-chemical model of the hydrogen molecule, R. M. Santilli and D.D. Shillady, Intern. J. Hydrogen Energy, Vol. 24, 943-956 (1999)

A new isochemical model of the water molecule, R. M. D.D. Shillady, Intern. J. Hydrogen Energy, Vol. 25, pp. 173-183 (2000)

The novel magnecular species of hydrogen and oxygen with increased specific weight and energy content, R. M. Santilli, Intern. J. Hydrogen Energy, Vol. 28, 177-196 (2003)



A new gaseous and combustible form of water, R. M. Santilli, Intern. Journal of Hydrogen Energy, in press (2006)

The above listed papers in which Dr. Santilli's findings where explained and exposed have been fully peer reviewed before publication. As such, I disagree with the allegations that "the chemical species invented by Dr. Santilli is not accepted by the scientific community".

It should also be noted that, one of numerous coauthor of Prof. Santilli, Prof. D. D. Shillady, is a senior chemist, full professor of chemistry at a leading U. S. university.

Prof. Dr T. Nejat Veziroglu  
**Declarant**

Date: 1 July 2006

Encl: Biography



# Clean Energy Research Institute

University of Miami □ Coral Gables, Florida 33124

**T. NEJAT VEZİROĞLU**

## **BIOGRAPHY**

# T. Nejat Veziroglu

## Curriculum Vitae

**PERSONAL DATA:**

Place and Date of Birth: Istanbul, Turkey  
January 24, 1924

**Marital Status:** Married since 1961  
Son Born in 1962  
Daughter Born in 1964

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## **EDUCATION:**

### Institutional Education:

The City and Guilds College,  
London, England  
University of London, England  
The Imperial College of Science,  
Engineering & Technology  
The University of London

### Degrees and Dates Conferred:

A.C.G.I., Mechanical Engineering, 1946  
B.Sc. Mechanical Engineering, 1946  
D.I.C., Advanced Studies, London, 1947  
Ph.D. - Heat Transfer, 1951

**Number of Years Service on this Faculty:** 33 years  
**Date of Original Appointment:** 1962 - Associate Professor  
**Date of Advancement in Rank:** 1966 - Full Professor

Non-Institutional Training:

The Imperial College of Science and Technology, London - Relaxation Methods, Summer School - 1948.

Electric Power Research Institute, Ankara, Turkey, Nuclear Engineering, Summer School 1956.

Massachusetts Institute of Technology, Cambridge, Two-Phase Flow, Summer School - 1964.  
University of California, Los Angeles, Nuclear Rocket Propulsion, Summer School - 1966.

**OTHER RELATED EXPERIENCE:**

Instructional:

University of Miami, Coral Gables, FL., Associate Professor, 1962-1966.

University of Miami, Coral Gables, FL., Director, Graduate Studies, 1965-1971.

University of Miami, Coral Gables, FL., Professor, Mechanical Engr., 1966-Present.

Middle East Technical University, Ankara, Turkey, Visiting Professor, Fall of 1969-70;  
Summers 1970-71-73-74.

University of Miami, Coral Gables, FL., Chairman, Mech. Engr., June 1971 - September 1975.

University of Miami, Coral Gables, FL., Associate Dean, Research, 1975-79.

Clean Energy Research Institute, Coral Gables, FL., Director, 1974-Present.

Professional:

Ruston-Bucyrus, Ltd., Lincoln, England, Summer 1943.

Alfred Herbert, Ltd., Coventry, England, Summer 1945.

Ordinance Inventions Examiner, Turkish Government, 1952-53.

Office of Soil Products, Ankara, Engineer & Scientific Advisor, 1954-56.

Engineering Consultant, Istanbul, 1957-58.

M. K. Veziroglu Construction Co., Istanbul, Turkey, Technical Director, 1959-61.

Consulting:

Technical Review Board, Energy Planning Service Division of Petroconsultants - Consultant.  
Society of Heat Science & Technique - Member.

Consultant Registry, Academy for Educational Development.

Consultant for Heat Transfer Engineering; National Science Foundation; University of Missouri, A.S.M.E. Journal of Heat Transfer; International Journal of Heat Transfer.

Conference Management, W. P. Johnson & Associates - Consultant.

Consultant for United Nations Industrial Development Organization.

Consultant, Referee Directory for Research Support System, Kuwait University.

Consultant, Dirasat Hundasia Journal, United Arab Emirates University.

States in which Registered: Turkey

**PUBLICATIONS**  
**Books Published**

1. Proceedings of the Hydrogen Economy Miami Energy (THEME) Conference, Editor, University of Miami Press, Coral Gables, FL, March 1974.
2. Proceedings of the Remote Sensing Applied to Energy Related Problems Symposium, Editor, University of Miami Press, Coral Gables, FL, December 1974.
3. Hydrogen Energy, two volumes, Editor, Plenum Press, New York, NY, March 1975.
4. Introduction to Hydrogen Energy, Editor, International Association for Hydrogen Energy, Coral Gables, FL, 1975.
5. Proceedings of the Hydrogen Energy Fundamentals Symposium, Editor, University of Miami Press, Coral Gables, FL, February 1975.
6. Remote Sensing - Energy Related Studies, Editor Hemisphere Publishing Corp., Washington, DC, 1975.
7. Proceedings of the First World Hydrogen Energy Conference, three volumes, Editor, University of Miami, Coral Gables, FL, 1976.
8. Proceedings of Condensed Papers of the Two-Phase Flow and Heat Transfer Symposium, Editor, Clean Energy Research Institute, University of Miami, Coral Gables, FL, December 1976.
9. Proceedings of Condensed Papers of the Solar Cooling and Heating National Forum, Editor, Clean Energy Research Institute, University of Miami, Coral Gables, FL, December 1976.
10. Proceedings of the Energy Conservation National Forum, Editor, Clean Energy Research Institute, University of Miami, Coral Gables, FL, January 1977.
11. Two-Phase Flow and Heat Transfer (Istanbul, August 1976), Co-Editor, with S. Kakaç and F. Mayinger, Hemisphere Publishing Corporation, Washington, DC, July 1977.
12. Two-Phase Transport & Reactors Safety, Ft. Lauderdale, October 1976, Co-Editor with S. Kakaç, Hemisphere Publishing Corporation, Washington, DC, August 1977.
13. Abstracts of Lectures and Papers: Izmir International Symposium - I on Solar Energy Fundamentals and Application (Izmir, Turkey, August, 1977), Editor, University of Miami Press, Coral Gables, FL, August.

14. Final Proceedings of the Solar Cooling and Heating National Forum, Editor, Hemisphere Publishing Corporation, Washington, DC, September 1977.
15. Proceedings of the Condensed papers of the Miami International Conference on Alternative Energy Sources, Editor, University of Miami Press, Coral Gables, FL, December 1977.
16. Alternative Energy Sources - An International Compendium, Editor, Hemisphere Publishing Corporation, Washington, DC, 1978.
17. Proceedings of the Condensed Papers of the Fifth Ocean Thermal Energy Conversion (OTEC) Conference, Co-Editor with A. Lavi, U.S. Government Printing Office, Washington, DC, February 1978.
18. Proceedings of the Fifth Ocean Thermal Energy Conversion Conference, Co-Editor with A. Lavi, U. S. Government Printing Office, Washington, DC, September 1978.
19. Symposium Lectures: First International Conference on Solar Energy, Editor, University of Miami Press, Coral Gables, FL., June 1978.
20. Proceedings of the Condensed Papers of the Solar Energy and Conservation Symposium-Workshop, Editor, University of Miami Press, Coral Gables, FL December 1978.
21. Second World Hydrogen Energy Conference Proceedings, Editor, Pergamon Press, Ltd., London, England, 1978.
22. Proceedings of the Extended Abstracts of the Second Multi-Phase Flow and Heat Transfer Symposium-Workshop, Editor, University of Miami Press, Coral Gables, FL, April 1979.
23. Condensed Papers of the Second Miami International Conference on Alternative Energy Sources, Editor, University of Miami Press, Coral Gables, FL, December 1979.
24. Solar Energy: International Progress, Editor, Pergamon Press, Inc., New York, NY, 1980.
25. Solar Energy and Conservation Technology, Editor, Pergamon Press, Inc., New York, NY, 1980.
26. Multiphase Transport, Editor, Hemisphere Publishing Corporation, Washington, DC, 1980.
27. Hydrogen Energy Progress, Co-Editor with K. Fuehi and T. Ohta, Pergamon Press, Ltd., London, England, 1980.
28. Condensed Papers of the Third Miami International Conference on Alternative Energy Sources, Editor, University of Miami Press, Coral Gables, FL, 1980.
29. Alternative Energy Sources II, Editor, Hemisphere Publishing Corporation, Washington, DC, 1981.

30. Condensed Papers of the Miami International Symposium Metal-Hydrogen Systems, Editor, University of Miami Press, Coral Gables, FL, 1981.
31. Condensed Papers o the 4<sup>th</sup> Miami International Conference on Alternative Energy Sources, editor, University of Miami Press, Coral Gables, FL, 1981.
32. Condensed Papers of the 16<sup>th</sup> Southeastern Seminar on Thermal Sciences, Editor, University of Miami Press, Coral Gables, FL, 1982.
33. Metal-Hydrogen Systems, Proceedings of Full Length Papers, Editor, Pergamon Press, Ltd., Oxford, England, 1982.
34. Fourth World Hydrogen Energy Conference, Co-Editor with W. D. Van Vorst and J. H. Kelley, Pergamon Press, Ltd., Oxford, England, 1982.
35. Alternative Energy Sources IV, Editor, Ann Arbor Science Publishers, Woburn, MA 1982.
36. Condensed Papers of the 5<sup>th</sup> Miami International Conference on Alternative Energy Sources, Editor, University of Miami Press, Coral Gables, FL, 1982.
37. Lecture Book, International Symposium-Workshop on Renewable Energy Sources, Co-Editor with M. K. Bhatty, H. W. Hiser and R. A. Siddiqui, PCSIR Laboratories, Lahore, Pakistan, 1983.
38. Condensed Papers of the Third Multi-Phase Flow and Heat Transfer Symposium-workshop, Editor, University of Miami Press, Coral Gables, FL, 1983.
39. Condensed Papers of the Sixth Miami International Conference on Alternative Energy Sources, Editor, University of Miami Press, Coral Gables, FL, 1983.
40. Condensed Papers of the Miami International Symposium on the Biosphere, Editor, University of Miami Press, Coral Gables, FL, 1983.
41. Alternative Energy Sources III, Editor, Hemisphere Publishing Corporation, New York, NY, 1983.
42. Alternative Energy Sources IV, Editor, Editor, Elsevier Science Publishers, The Netherlands, 1983.
43. Thermal Science 16, Editor, Hemisphere Publishing Corporation, New York, NY, 1983.
44. Renewable Energy Sources: International Progress, Editor, Elsevier Science Publishers, The Netherlands, 1984.

45. Condensed Papers of the China-U.S. Seminar on Two-Phase Flow and Heat Transfer, Co-Editor with X.-J. Chen, Xin Jiatong University, China, 1984.
46. Multi-Phase Flow and Heat Transfer III, Editor, Elsevier Science Publishers, New York, NY, 1984.
47. Hydrogen Energy Progress V, Co-Editor with J. B. Taylor, Pergamon Press, Ltd., Oxford, England, 1984.
48. The Biosphere: Problems and Solutions, Studies in Environmental Science, Editor, Elsevier Science Publishers, The Netherlands, 1985.
49. Condensed Papers of the International Symposium-Workshop on Particulate and Multi-Phase Processes and 16th Annual Meeting of the Fine Particle Society, Co-editor with T. Ariman, University of Tulsa, OK, 1985.
50. Alternative Energy Sources VI (Proceedings of the 6th Miami International Conference on Alternative Energy Sources), Editor, Hemisphere Publishing Corporation, New York, NY, 1985.
51. Two-Phase Flow and Heat Transfer: China - U.S. Progress, Co-editor with X.-J. Chen, Hemisphere Publishing Corporation, New York, NY, 1985.
52. Condensed Papers of the 7th Miami International Conference on Alternative Energy Sources, University of Miami Press, Coral Gables, FL, 1985.
53. International Journal of Hydrogen Energy, Monthly Scientific Journal, Editor, Pergamon Press, Oxford, England, 1985.
54. Particulate and Multi-Phase Processes (Proceedings of the International Symposium-Workshop on Particulate and Multi-Phase Processes), Co-editor with T. Ariman, Hemisphere Publishing Corporation, New York, NY, 1986.
55. Hydrogen Systems: Beijing Forum (Proceedings of the Beijing International Symposium on Hydrogen Systems), Co-editor with D. Bao and Y. Zhu, Pergamon Press, Oxford, England, 1986.
56. Alternative Energy Sources VII (Proceedings of the 7th Miami International Symposium on Alternative Energy Sources), Editor, Hemisphere Publishing Corporation, New York, NY, 1986.
57. Proceedings of the International Symposium-Workshop on Silicon Technology Development and its Role in the Sun Belt Countries, Co-editor with A. Mufti, National Institute of Silicon Technology, Islamabad, Pakistan, June 1987.

58. Condensed Papers of the 4th Miami International Symposium on Multi-Phase Transport and Particulate Phenomena, University of Miami Press, Coral Gables, FL, December 1986.
59. Hydrogen Energy Progress VI (Proceedings of the 6th World Hydrogen Energy Conference), Co-editor with N. Getoff and P. Weinzierl, Pergamon Press, New York, NY 1986.
60. International Symposium-Workshop on Silicon Technology Development and Its Role in the Sun-Belt Countries, Co-editor with A. Mufti, Pan Graphics (Pvt) Ltd., Islamabad, Pakistan, 1987.
61. Condensed Papers of the 8th Miami International Conference on Alternative Energy Sources, University of Miami Press, Coral Gables, FL, December 1987.
62. Multi-Phase and Particulate Transport IV (Proceedings of the 4th Miami International Symposium on Multi-Phase Transport and Particulate Phenomena), Editor, Hemisphere Publishing Corporation, New York, NY, 1988.
63. Hydrogen Energy Progress VII (Proceedings of the 7th World Hydrogen Energy Conference), Co-editor with A. N. Protsenko, Pergamon Press, New York, NY, 1988.
64. Condensed Papers of the 5th Miami International Symposium on Multiphase Transport and Particulate Phenomena, University of Miami Press, Coral Gables, FL, December 1988.
65. Alternative Energy Sources VIII (Proceedings of the 8th Miami International Conference on Alternative Energy Sources), Editor, Hemisphere Publishing Corporation, New York, NY, 1989.
66. Condensed Paper of the 9th Miami International Congress on Energy and Environment, University of Miami Press, Coral Gables, FL, December 1989.
67. Environmental Problems and Solutions: Greenhouse Effect, Acid Rain, Pollution, Editor, Hemisphere Publishing Corporation, New York, NY, 1989.
68. Multiphase Transport and Particulate Phenomena, Editor, Hemisphere Publishing Corporation, New York, NY, 1990.
69. Energy and Environment Progress I, Nova Science Publishers, Commack, NY, 1990.
70. Hydrogen Energy Progress VIII, Editor, Pergamon Press, New York, NY, 1990.
71. Condensed Papers of the 6th Miami International Symposium on Heat and Mass Transfer, Editor, Clean Energy Research Institute, University of Miami, Coral Gables, FL, 1990.
72. International Journal of Energy - Environment - Economics, Nova Science Publishers, Commack, NY 1990.

73. Multiphase Transport and Particulate Phenomena, Editor, Hemisphere Publishing Corporation, New York, NY, 1990.
74. Energy and Environmental Progress, Nova Science Publishers, Commack, NY, 1991.
75. Solar Hydrogen Energy: The Power to Save the Earth, co-authored with J. O'M. Bockris, McDonald Group - Optima, England, 1991.
76. Project Hydrogen '91: Launching a Sustainable Energy Future, Co-editor with R. Billings, Proceedings of Project Hydrogen '91 Conference, Independence, MO, 1992.
77. Hydrogen Energy Progress IX, Editor, International Association for Hydrogen Energy, Coral Gables, FL, 1992.
78. Hydrogen Energy Progress X, Co-Editor with D. Block, International Association for Hydrogen Energy, Coral Gables, FL, 1992.
79. Heat and Mass Transfer: An Era of Change, Editor, Nova Science Publishers, Inc., Commack, NY, 1994.
80. Condensed Papers of the International Conference on Energy and Environment, Co-Editor, National Natural Science Foundation of China, 1995.
81. HYPOTHESIS: Hydrogen Power Thermal and Electrochemical Systems International Symposium, Co-Editor with S. P. Cicconardi and D. Dini, Cassino-Gaeta, Italy, 1995.
82. New Materials for Fuel Cell Systems I, Co-Editor with O. Savadogo and P. R. Roberge, Les Editions de l'Ecole Polytechnique de Montreal, Montreal, Quebec, Canada, 1995.
83. Hydrogen Energy Progress XI, Proceedings of the 11<sup>th</sup> World Hydrogen Energy Conference, Co-Editor with C.-J. Winter, J. P. Baselt and G. Kreysa, International Association for Hydrogen Energy, Coral Gables, FL, 1996.
84. Hydrogen Energy Progress XII, Proceeding of the 12<sup>th</sup> World Hydrogen Energy Conference, Co-Editor with J. C. Bolcich, International Association for Hydrogen Energy, Coral Gables, FL 1998.
85. Hydrogen Energy Progress XIII, Proceedings of the 13<sup>th</sup> World Hydrogen Energy Conference, Co-Editor with Z. Q. Mao, Beijing, China, June 2000.
86. Hydrogen Energy Progress XIV (CD Rom), Editors: T. Nejat Veziroglu and Tapan Bose, Int. Assoc. Hydrogen Energy, June 2002.
87. Hydrogen Materials Science and Chemistry of Metal Hydrides, Editors: T. N. Veziroglu, S. Y. Zaginaichenko, D. V. Schur and V. I. Trefileov, NATO Science series, V82, Kluver Academic Publishers, September 2002.

88. "Environmental Challenges and the Post-Fossil Fuel Era," Editor of Chapter, in Risk and Uncertainty in the Changing Global Energy Market Implications for the Gulf, first published in 2004, by The Emirates Center for Strategic Studies and Research, Abu Dhabi, United Arab Emirates.
89. "Managing Risk and Uncertainty: Conclusions," Editor of a Chapter, in Risk and Uncertainty in the Changing Global Energy Market Implications for the Gulf, first published in 2004, by The Emirates Center for Strategic Studies and Research, Abu Dhabi, United Arab Emirates.
90. "Study of Thermodynamic Parameters of Hydrogen Gas by Grapho-Analytic Method," Editor of a Chapter in Hydrogen Materials Science and Chemistry of Carbon Nanomaterials, with B. Ibrahimoglu, A. Huseynov and D. Schur, et al., 225-232. ©2004 Kluwer Academic Publishers, Netherlands.
91. "Hydrogen Energy Solutions." Editor of a Chapter in Environmental Solutions, with S. A. Sherif, F. Barbir, N. L. Nemerow, and F. J. Agardy, Elsevier Science, Inc., New York, 2005.

#### **JURIED OR REFEREEED PAPERS**

1. "Thermal Conductance of Metal Surfaces in Contact," jointly with M. Fishenden, Proc. International Heat Transfer Conference, London, Institute of Mechanical Engineers, American Society of Mechanical Engineers, 1951.
2. "A Parametric Study of Boiling Instability," jointly with A. H. Stenning, Proc. of the ASME Winter Annual Meeting, Paper No. 64-WAK/FE-28, December 1964.
3. "Oscillations in Two-Component, Two-Phase Flow," jointly with A. H. Stenning, Proc. of the ASME Applied Mechanics and Fluids Engineering Joint Conference, Paper No. 65-FE-24, June 1965.
4. "Flow Oscillation Modes in Forced-Convection Boiling," jointly with A. H. Stenning, Proc. of the 1965 Heat Transfer and Fluid Mechanics Institute at Los Angeles, Paper No. 18, June 1965.
5. "Density-Wave Oscillations in Boiling Freon-11 Flow," jointly with A. H. Stenning, Proc. of the ASME Winter Annual Meeting, Paper No. 66-WA/HTI-49, November 1966.
6. "Pressure-Drop Oscillations in Forced Convection Flow with Boiling," jointly with A. H. Stenning and G. M. Callahan, Proc. of the EURATOM Symposium on Dynamics of Two-Phase Flows, Eindhoven, The Netherlands, September 1967.
7. "Instabilities on Boiling Upwards Flows," jointly with S. S. Lee, Proc. of the International Symposium on Research on Concurrent Gas-Liquid Flow, Waterloo, Canada, September 1968.

8. "Thermal Conductance on Two-Dimensional Constrictions," jointly with S. Chandra, Progress in Astronautics and Aeronautics, Vol. 21, 1969.
9. "Boiling Flow Instabilities in Parallel Channels," jointly with S. S. Lee, Proc. of the Joint Symposium on Fluid Mechanics and Measurements in Two-Phase Flow Systems, University of Leeds, England, September 1969.
10. "Direction Effect in Thermal Contact Conductance," jointly with S. Chandra, Proc. of the Fourth International Heat Transfer Conference, Paper Cu 3.5, Vol. 1, August 1970.
11. "Boiling Flow Instabilities in a Cross-Connected Parallel Channel Upflow System," jointly with S. S. Lee, Proc. of the ASME AIChE Heat Transfer Conference, ASME Paper, Tulsa, OK, August 1971.
12. "Boiling Flow Instabilities in Four Parallel Channel Upflow System," jointly with S. Kakaç, H. B. Aksu and Y. Alp, Proc. of the International Meeting on Reactor Heat Transfer, Karlsruhe, West Germany, October 1973.
13. "Thermal Conductance of Contacts with Interstitial Plates," jointly with H. Yüncü, Proc. of the XII International Conference on Thermal Conductivity, University of Missouri-Rolla, Rolla, MO, November 1973.
14. "Dynamics of a Universal Hydrogen Fuel System," jointly with O. Basar, Proc. of the Hydrogen Economy Miami Energy (THEME) Conference, Miami Beach, FL, March 1974.
15. "Hydrogen as a Universal Fuel," jointly with O. Basar, Proc. of the International Conference on Energy, Europe and the 1980's, London, England, May 1974.
16. "Sustained and Transient Boiling Flow Instabilities in a Cross-Connected Four Parallel Channel Upflow System," jointly with S. Kakaç, K. Akyuzlu and O. Berkol, Proc. of the Fifth International Heat Transfer Conference, Paper No. B5-11, Tokyo, Japan, September 1974.
17. "Remote Sensing Applied to Thermal Pollution," jointly with S. S. Lee, S. Sengupta and N. Weinberg, Proc. of Symposium on Remote Sensing Applied to Energy-Related Problems, Miami, FL, 2-4 December 1974.
18. "Application of Remote Sensing to Numerical Modeling," jointly with S. S. Lee, S. Sengupta and N. Weinberg, Proc. of Symposium on Remote Sensing Applied to Energy-Related Problems, Miami, FL, 2-4 December 1974.
19. "Near and Far-Field Models of Coastal Areas," jointly with S. Sengupta, S. S. Lee, Proc. of the Review Meeting on Hydrodynamical Numerical Models for Coastal and Open Ocean Areas, (American Geophysical Union) at Monterey, CA, December 1974.

20. "Application of Remote Sensing to Thermal Pollution Analysis," jointly with H. W. Hiser, S. S. Lee and S. Sengupta, Proc. of the Fourth Annual Remote Sensing of Earth Resources Conference, University of Tennessee Space Institute, Tullahoma, TN, March 1975.
21. "Survey of World Power Demand and Future Energy Sources," jointly with S. Kakaç, Proc. Energy Symposium, Shiraz, Iran, April-May 1975.
22. "Monitoring of Thermal Discharges into Biscayne Bay," jointly with S. Kakaç, Proc. Southeastern Seminar on Thermal Sciences, Knoxville, TN, April 1975.
23. "Mathematical Modeling of Thermal Pollution in Coastal Regions," jointly with S. S. Lee, S. Sengupta and C. Tsai, Proc. Southeastern Seminar on Thermal Sciences, Knoxville, TN, April 1975.
24. "Hydrogen Energy System and Population Control," jointly with S. Kakaç, O. Basar and N. Forouzanmehr, Proc. of the U.S.-Japan Joint Seminar on Key Technologies for the Hydrogen Energy System, Tokyo, Japan, 20-23 July 1975.
25. "A Universal Hydrogen Energy System and World Parameters," Proc. Symposium-Introduction to Hydrogen Energy, Maracay, Venezuela, October 1975.
26. "Solar Production of Hydrogen as a Means of Storing Solar Energy," jointly with S. Kakaç, Proc. of the COMPLES International Meeting, Dhahran, Saudi Arabia, 1-6 November 1975.
27. "Hydrogen Production Using Nuclear, Solar and Other Primary Energies," jointly with S. Kakaç, Proc. International Conference on Mechanical Engineering with Main Emphasis on Energy, Lahore, Pakistan, March 1976.
28. "The Solar-Hydrogen Energy System," jointly with T. Ohta, Proc. Thirteenth Space Congress, Cocoa Beach, FL, April 1976.
29. "Fossil/Hydrogen Energy Mix and Population Control," jointly with S. Kakaç, O. Basar and N. Forouzanmehr, International Journal of Hydrogen Energy, June 1976.
30. "Fundamentals of Two-Phase Flow Oscillations and Experiments in Single Channel Systems," jointly with S. S. Lee and S. Kakaç, Proc. NATO Advanced Study Institute, Istanbul, Turkey, August 1976.
31. "Sustained and Transient Boiling Flow Instabilities in Two-Parallel Channel Systems," jointly with S. S. Lee and S. Kakaç, Proc. NATO Advanced Study Institute, Istanbul, Turkey, August 1976.
32. "Boiling Flow Instabilities in a Multi-Channel Upflow System," jointly with S. Kakaç and S. S. Lee, Proc. NATO Advanced Study Institute, Istanbul, Turkey, August 1976.
33. "Sustained Boiling Flow Instabilities in a Cross-Connected Four Parallel Channel Upflow System," jointly with S. Kakaç, Proc. CHISA -75, Prague, Czechoslovakia, August 1976.

34. "Analysis of Thermal Conductance of Contacts with Interstitial Plates," jointly with H. Yüncü and S. Kakaç, Int. Journal of Heat and Mass Transfer, Vol. 19, No. 9, pp. 959-966, 1976.
35. "Transient Boiling Flow Instabilities in Four Parallel Channel Upflow System," jointly with S. Kakaç and N. Ozboya, Two-Phase Flow and Heat Transfer Symposium Proc., Ft. Lauderdale, FL, October 1976.
36. "Production of Hydrogen as a Means of Storing Energy," jointly with S. Kakaç, Proc. of the 1st World Hydrogen Energy Conference, Istanbul, Turkey, September 1977.
37. "Solar Production of Hydrogen," jointly with S. Kakaç, Chapter 18 of Solar Energy Engineering, Academic Press, Inc., NY, 1977.
38. "Principles of Solar Cooling and Heat," jointly with A. J. Parker, Jr., and D. E. Cassel, Symposium Lectures, International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 1978.
39. "Application of Solar Cooling for a School Building in the Subtropics," jointly with A. J. Parker, Jr., D. E. Cassel, and R. E. Hedden, Symposium Lectures, International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 1978.
40. "An Energy Infrastructure: Hydrogen Energy System," Interciencia, 1978.
41. "The Case for Hydrogen Energy," The UNESCO Courier, June 1978.
42. "Effect of Inlet Subcooling on Sustained and Transient Boiling Flow Instabilities in a Single Channel Upflow System," jointly with S. Kakaç, H. S. Ergur, and I. Ucar, Proc. of the 6th International Heat Transfer Conference, Toronto, Canada, August 1978.
43. "Unusual Applications of Hydrogen," J. Energy Systems, April 1979.
44. "Finite Differences Analysis of Two-Phase Flow Pressure-Drop and Density-Wave Oscillations," jointly with T. Dogan, S. Kakaç and K. Akyuzlu, Proc. 2nd Multi-Phase Flow and Heat Transfer Symposium Workshop, Miami Beach, FL, April 1979: also named Wärme-und Stoffübertragung 14, pp. 253-267, 1980.
45. "Lumped-Parameter Analysis of Two-Phase Flow Instabilities," jointly with T. Dogan, S. Kakaç and K. Akyuzlu, Proc. 2nd Multi-Phase Flow and Heat Transfer Symposium Workshop, Miami Beach, FL, April 1979.
46. "A Comparison of Regional and World Energy Models," jointly with S. M. Ridenour, Proc. Seminar on Cooperative Technological Forecasting: Solar Energy, Puerto de la Cruz, Tenerife, Canary Islands, Spain, July 1979.

47. "Hydrogen Production by Thermoelectrochemical Cycles Using Sodium Chloride," jointly with A. A. El-Bassuoni, Proc. 2nd Miami International Conference on Alternative Energy Sources, Miami Beach, FL, December 1979.
48. "An Experimental Investigation of Thermal Contact Conductance of Multilayered Electrically Insulated Sheets," jointly with J. W. Sheffield and A. Williams, Proc. AIAA 14th Thermophysics Conference, Orlando, FL, June 1979, and Progress in Astronautics and Aeronautics, Vol. 20, pp. 130-146, 1980.
49. "Hydrogen and Fresh Water Production from Sea Water," jointly with A. A. El-Bassuoni and J. W. Sheffield, Proc. 3rd World Hydrogen Energy Conference, Tokyo, Japan, June 1980.
50. "Thermal Contact Conductance of Coated Multi-Layered Sheets," jointly with J. W. Sheffield, Heat Transfer and Thermal Control, Progress in Astronautics and Aeronautics, Vol. 78, Edited by A. L. Crosbie, Martin Summerfield, Series Editor, 1981.
51. "Effects of Interface Gases on Contact Conductance," jointly with A. Mentes, R. Samudrala, J. W. Sheffield and A. Williams, AIAA 19th Aerospace Sciences Meeting Proceedings, St. Louis, MO, 12-15 January 1981.
52. "Effect of Heat Transfer on Density-Wave Oscillations - A Finite Difference Analysis," jointly with K. M. Akyuzlu, Proc. 16th Southeastern Seminar on Thermal Sciences, Miami, FL, April 1982.
53. "Effect of Heater Surface Configurations on Two-Phase Flow Instabilities in a Vertical Boiling Channel," jointly with A. Mentes, H. Gurgenci, O. T. Yildirim and S. Kakaç, Proc. 16th Southeastern Seminar on Thermal Sciences, Miami, FL, April 1982; also Wärme-und-Stoffübertragung 17, pp. 163-168.
54. "Hydrogen and Fresh Water Production from Sea Water," jointly with A. A. El-Bassuoni and J. W. Sheffield, Hydrogen Energy Progress, Vol. 3, pp. 1361-1372, 1981; International Journal of Hydrogen Energy, Vol. 7, No. 12, pp. 919-923, 1982.
55. "Thermoelectrochemical Hydrogen Production Using Sodium Chloride," jointly with A. A. El-Bassuoni and J. W. Sheffield, Alternative Energy Sources II, Vol. 8, pp. 3389-3403, 1982.
56. "Effective Costs of Fuels: Comparison of Hydrogen with Fossil Fuels," Hydrogen Energy Progress IV, Vol. 4, pp. 1523-1538, 1982.
57. "Pressure-Drop and Density-Wave Instability Thresholds in Boiling Channels," jointly with H. Gurgenci and S. Kakaç, Proc. 16th Southeastern Seminar on Thermal Sciences, Miami, FL, April 1982.

58. "Heat Transfer in Oscillating Two-Phase Flows and Effect of Tube-Surface Conditions," jointly with Z. H. Lin, S. Kakaç, H. Gurgenci and A. Mentes, Proc. 7th International Heat Transfer Conference, Vol. 5, pp. 331-336, Munich, Germany, 6-10 September 1982.
59. "A Solar-Collector Dryer," jointly with A. M. Tayeb, Proc. 5th Miami International Conference on Alternative Energy Sources, Miami Beach, FL, 13-15 December 1982.
60. "The Unifier of Non-Conventional Energy Sources: Hydrogen Energy System," Lecture Book of the International Symposium-Workshop on Renewable Energy Sources, Lahore, Pakistan, 18-23 March 1983.
61. "Effect of Inlet Subcooling on Two-Phase Flow Instabilities," jointly with O. T. Yildirim, A. Mentes, L. Q. Fu and S. Kakaç, Proc. 3rd Multi-Phase Flow and Heat Transfer Symposium-Workshop, Miami Beach, FL, 18-20 April 1983.
62. "A Study of Subcooled Flow Boiling," jointly with Z. H. Kin, Proc. 3rd Multi-Phase Flow and Heat Transfer Symposium-Workshop, Miami Beach, FL, 18-20 April 1983.
63. "Fundamentals and Applications of Hydrides," jointly with J. W. Sheffield, Lecture Book: International Symposium-Workshop on Renewable Energy Sources, pp. 319-343, 1983.
64. "Simplified Nonlinear Descriptions of Two-Phase Flow Instabilities in Vertical Boiling Channel," jointly with H. Gurgenci and S. Kakaç, Int. J. Heat Mass Transfer, Vol. 26, No. 5, pp. 671-679, 1983.
65. "Review of Two-Phase Flow Instabilities," jointly with S. Kakaç, Advances in Two-Phase Flow and Heat Transfer, Martinus Nijhoff Publishers, Boston, MA, 1983.
66. "Solar Hydrogen Economy for USA," jointly with J. O'M. Bockris, Int. J. Hydrogen Energy, Vol. 8, No. 5, pp. 323-340, 1983.
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214. "Performance of a Double Pass Photovoltaic Thermal Solar Collector Suitable for Solar Drying Systems," jointly with K. Sopian, H. T. Liu and S. Kakac, Energy Conversion & Management, 41, pp. 353-365, 2000.

215. "Analysis of Spanish Energy Planning (1991-2000): Current Situation and Suggestions on the Use of New Energy Systems," Proceedings of the 4th International Conference on New Energy Systems and Conversions, Osaka, Japan, 27 June-1 July 1999.
216. "Hydrogen Energy System: Fundamentals and Application," jointly with S. A. Sherif, and F. Barbir, Asia Pacific Tech Monitor, January/February 1999.
217. "Hydrogen Energy Systems," jointly with S. A. Sherif, and F. Barbir, " Wiley Encyclopedia of Electrical and Electronics Engineering, Webster, J. G. (Editor), John Wiley & Sons, Inc., New York, ISBN 0-471-13946-7, February 1999.
218. "Recent Directions of World Hydrogen Production," jointly with M. Momirlan, Renewable and Sustainable Energy Reviews, Vol. 3, pp. 219-231, 1999.
219. "Performance of a Double Pass Photovoltaic Thermal Solar Collector Suitable for Solar Drying Systems," jointly with K. Sopian, H. T. Liu, and S. Kakac, Energy Conversion and Management, Vol. 41, p. 353-365, 1999.
220. "Solar-Hydrogen Energy System for Egypt," jointly with M. A. Abdalah, and S. S. Asfour, Int. J. Hydrogen Energy, Vol. 24, pp. 505-517, 1999.
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223. "Analysis of Spanish Energy Planning (1991-2000): Current Situation and Suggestions on the Use of New Energy systems," Proceedings of the 4th International Conference on New Energy Systems and Conversions, Osaka, Japan, 27 June-1 July 1999.
224. "An Environmentally Balanced Industrial Complex of Fertilizer and Cement Plants," jointly with S. V. Krishnan, N. L. Nemerow, P. Khanna and T. Chakrabarti, The International Journal of Science and Engineering: Research and Applications, Vol 1, No. 1, 2000.
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227. "Transport Mechanism and Performance Simulation for PEM Fuel Cells," Lixin You, Hongtan Liu, Sadik Kakac and T. Nejat Veziroglu, Hydrogen Energy Progress XIII, Proceedings of the 13th World Hydrogen Energy Conference, Beijing, China, June 2000.

228. "Thermoeconomics of Hydrogen Liquefiers Operating on the Modified Collins Cycle," M. T. Syed, S. A. Sherif and T. N. Veziroglu, Proceedings of the 35th Intersociety Energy Conversion Engineering Conference and Exhibit (IECEC), AIAA Paper 2000-3050, Session PE-I-1, Las Vegas, Nevada, Vol. 2, pp. 1383-1393, July 24-28, 2000.
229. "Quarter Century of Hydrogen Movement, T. N. Veziroglu, Int. J. Hydrogen Energy, Vol. 25, No. 12, December 2000.
230. "Hydrogen Production by Biological Processes: .A Survey of Literature," jointly with Debabrata Das, Int. J. Hydrogen Energy, Vol. 26, No. 1, pp. 13-28, January 2001.
231. "Long-Term Environmental and Socio-Economic Impact of a Hydrogen Energy Program in Brazil," jointly with L. C. de Lima, Int. J. Hydrogen Energy, Vol. 26, No. 1, pp. 39-46, January 2001.
232. "Fundamentals of Hydrogen Energy Utilization." in Advances in Solar Energy, jointly with F. Barbir, S. A. Sherif, Vol. 14, Chapter 3, pp. 67-100, D. Y. Goswami, and K. W. Boer, (Editors), (ISBN 0-89553-257-3), (ASES), Boulder, Colorado, August 2001,
233. "From Hydrogen Economy to Hydrogen Civilization," Int. J. Hydrogen Energy, jointly with Victor A. Goltsov, Vol. 26, No. 9, pp. 909-915, September 2001.
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235. "From Hydrogen Economy to Hydrogen Civilization: Planetary and Regional Aspect of the Transition", jointly with V. A. Goltsov, and L. F. Goltsova, International Scientific Journal of Alternative Energy and Ecology, April 2002.
236. "Current Status of Hydrogen Energy", jointly with M. Momirlan, Renewable and Sustainable Energy Reviews, Vol. 6, pp. 141-179, June 2002.
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238. "Energy Kingdom", jointly with H. A. Abaoud, International Journal of Energy Conversion and Management, Vol. 43, pp. 855-861, September 2002.
239. "Energy Carriers and Conversion Systems with Emphasis on Hydrogen, " jointly with Tokio Ohta, Knowledge for Sustainable Development, EOLSS Encyclopedia, Vol. 2, 30 pgs., September 2002.
240. "International Programs on Hydrogen Energy," jointly with Tokio Ohta, UNESCO Publications, 26 pgs., September 2002.

241. "Wind Energy and the Hydrogen Economy," jointly with S. A. Sherif and F. Barbir, Proceedings of the 22<sup>nd</sup> ASME Wind Energy Symposium, Reno Nevada, AIAA, Paper 2003-0691, pp. 155-166, Keynote Paper, January 6-9 2003.
241. "Principles of Hydrogen Energy Production, Storage and Utilization," S. A. Sherif and F. Barbir, Journal of Scientific and Industrial Research, Vol. 62, No. 1, pp. 46-63, January - February 2003.
242. "A Universal Relationship for Estimating Clear Sky Insolation," C. Lingamgunta and T. N. Veziroglu, Energy Conversion and Management 45:27-52, 2003.
243. "Role of PEM Fuel Cells in Diversifying Electricity Production in the United Arab Emirates," A. Kazim, and T. N. Veziroglu, International Journal of Hydrogen Energy, Vol. 238, pp. 349-355, March 2003.
244. "Mathematical Modelling of Hydrogen Storage in a La Ni<sub>5</sub> Metal-Hydride Bed," Y. Kaplan and T. N. Veziroglu, International Journal of Energy Research, 27 (11), 1027-1038, 2003.
245. "Application of A Two-Phase Mathematical Model For Hydrogen Evolution in an Electrochemical Cell," jointly with M. D. Mat and Y. Kaplan, I. Ege Enerji Sempozyumu Ve Sergisi Pamukkale Universitesi Muhendislik Fakultesi Denizli, May 2003.
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- 251) "Hydrogen Economy and Nuclear Energy Synergism," IAEA 50<sup>th</sup> Anniversary Bulletin, 2004.

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- 259) "The Unique Rodriguez-Baker Data on Hydrogen Storage in Graphite Nanofibers Might Be True", jointly with Y.S. Nechaev and D.V. Iourtchenko. Proceedings of 15th World Hydrogen Energy Conference, June 27-July 2, 2004. Yokohama, Japan.
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- 261) "Hydrogen detectors for hydrogen transport," jointly with A.L. Gusev, E.V. Kudel'kina, P.A. Chaban, A. V. Ivkin and M.D. Hampton, Proceedings of the International Workshop Photovoltaics, H2 and Thermal Energy-New Developments in Russia and other CIS Countries, Freiburg, Germany, 2004, pp. 43-47.
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- 265) "Experimental and Theoretical Study of Metal-Hydride Reactors" jointly with Y. Kaplan, Proceedings of the NATO Advanced Research Workshop, Fuel Cell Technologies: State and Perspectives, 06-10 June 2004, Kyiv, Ukraine.

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4. "Oscillations in Two-Phase Two Component Flows," jointly with A.H. Stenning, NASA CR-59504, October 1964.
5. "Boiling Flow Instability," Jointly with A.H. Stenning, NASA Grant NSG-424, Report No.5, November 1964.
6. "Flow Oscillation Modes in Forced-Convection Boiling," jointly with A.H. Stenning, NASA Grant NSG-424, January 1965.
7. "Instabilities in the Flow of Boiling Liquid," jointly with A.H. Stenning, NASA CR-164, February 1965.
8. "Boiling Flow Instability," NASA Grant NSG-424, Report No. 7, May 1965.
9. "Boiling Flow Instability," jointly with A.H. Stenning, NASA Grant NSF-424, Report No. 9, March 1966.
10. "Density-Wave Oscillations in Boiling Freon-11 Flow," jointly with A.H. Stenning, NASA Grant NSF-424, Report No. 9, March 1966.

11. "Correlations of Thermal Contact Conductance Experimental Results," NASA NGR-10-007-010, Report No. 1, February 1967.
12. "Oscillations in Two-Component Two-Phase Flow," jointly with A.H. Stenning, NASA CR-72122, Final Report, Vol. 1, February 1967.
13. "Flow Oscillations in Forced-Convection Boiling," jointly with A.H. Stenning, NASA CR-72122, Final Report, Vol. 11, February 1967.
14. "Oscillations in Boiling Upward Flow," AEC Oak Ridge National Laboratory, Union Carbide Subcontract No. 2785, Final report, July 1967.
15. "Thermal Conductance of Two-Dimensional Constructions," jointly with S. Chandra, NASA CR-02584, January 1968.
16. "Boiling Upward Flow Instabilities," jointly with S. S. Lee, AEC Oak Ridge National Laboratory, Sub-contract No. 2975, Final Report, July 1968.
17. "Thermal Conductance of Two-Dimension Eccentric Constructions," jointly with M. A. Huerta, NASA CR-96281, September 1968.
18. "Boiling Flow Instabilities in a Two-Parallel Channel Upflow System," jointly with S. S. Lee, AEC Oak Ridge National Laboratory, Sub-contract No. 2975, Final Report, July 1969.
19. "Boiling Flow Instabilities in Cross-Connected Parallel Channels," jointly with S. S. Lee, AEC Oak Ridge National Laboratory, Sub-Contract No. 2975, Final Report, June 1970.
20. "Sustained and Transient Boiling Flow Instabilities in a Cross-Connected Parallel Channel Upflow System," jointly with S. S. Lee, AEC Oak Ridge National Laboratory, Sub-contract No. 2975, Final Report, July 1971.
21. "Statistical Study of Thermal Contact Conductance," NASA Grant NGR 10j-007-010 Report, NASA CR 126743, June 1972.
22. "Instabilities in Liquid -Vapor Flows," jointly with S. Kakaç, Final Report, Project MAG-197, Middle East technical University, Ankara, Turkey, December 1972.
23. "Hardness of Cu-Be Alloys at Elevated Temperatures," jointly with N. Forouzanmehr, Final Report to Kawecki Berylco Industries, Inc., Mechanical Engineering Dept., University of Miami, June 1973.
24. "Detailed Technical Report: Feasibility of Remote Sensing for Detecting Thermal Pollution," jointly with S. S. Lee, NASA Contract NAS 10-8402, Final Report, NASA CR-134453, December 1973.

25. "Executive Summary Report: Feasibility of Remote Sensing for Detecting Thermal Pollution," jointly with S. S. Lee, NASA Contract NAS 10-8402, Executive Report, December 1973.
26. "Two-Phase Flow Instabilities in a Four Parallel Channel System with Cross-Connections," jointly with S. Kakaç, O. Berkol and H. Akyuzlu, Final Report, Project MAG-197, Middle East Technical University Ankara, Turkey, August 1974.
27. "Detailed Technical Report: Prediction and Detection of Thermal Pollution," joint with S. S. Lee, NASA Contract NAS 10-8498, Executive Report, October 1974.
28. "Executive Summary Report: Prediction and Detection of Thermal Pollution," jointly with S. S. Lee, NASA Contract NAS 10-8498, Executive Report, October 1974.
29. "Dade County, Florida School, Commercial Solar Demonstration, Concept Studies for Cooled/Heated Schools in Subtropical Regions," jointly with Investigators and Consultants, Final Report ERDA Contract E- (40-1)-4941 ORO/4941-76/1, September 1976.
30. Workshop Report: Two Phase Flow and Heat Transfer Symposium-Workshop, 18-20 October 1976, NSF.
31. First Annual Report: Two-Phase Flow Instabilities and Effect of Inlet Subcooling, NSF Project ENG 75:16618, May 1977.
32. Workshop Report: Solar Energy and Conservation Symposium-Workshop, Miami Beach, Florida, DoE Contract #DE-ACPI-79 CS 30014, 11-23 December 1978.
33. First Annual Report: Thermal Contact Conductance of Multilayered Electrically Insulated Sheets, NSF Project ENG 77:25036, March 1979.
34. Workshop Report: Multi-Phase Flow and Heat Transfer Symposium-Workshop, ONR N-00014-79G0012 and NSF ENG-7825272, April 1979.
35. Final Report: Two Phase Flow Instabilities and Effect of Inlet Subcooling, NSF Project ENG 75-16618, February 1980.
36. Final Report: Thermal Contact Conductance of Multilayered Electrically Insulated Sheets, NSF Project ENG 177:25036, March 1981.
37. Annual Report: Two-Phase Flow Instabilities, NSF Project CME 79-29-20018, May 1981.
38. Final Report: Two-Phase Flow Instabilities, NSF Project CME 79-29-20018, July 1983.
39. Annual Report: Boiling Flow Instabilities in Parallel Channels with Enhanced Heat Transfer, NSF Project MEA 82-14867, May 1984.

40. Annual Report: Boiling Flow Instabilities in Parallel Channels with Enhanced Heat Transfer, NSF Project MEA 82-14867, May 1985.
41. Final Report: Boiling Flow Instabilities in Parallel Channels with Enhanced Heat Transfer, NSF Project MEA 82-14867, January 1986.
42. First Annual Report: Two-Phase Flow Thermal Instabilities in a Single Channel System, NSF Project CBT-86-12282, January 1988.
43. Annual Report: Two-Phase Flow Thermal Instabilities in a Single Channel System, NSF Project CBT-86-12282, January 1989.
44. Annual Report: Attenuation of Solar Radiation in Atmosphere, NSF Project INT 86-01262/A01, February 1989.
45. Annual Report: Fluid Dynamical Models for Determining Wind Characteristics and Their Application in Pakistan, NSF Project INT-8709973, March 1989.
46. Annual Report: U.S. Pakistan Joint Research on Advanced Renovation of Small Industry Waste, NSF Project INT18520198, March 1989.
47. Annual Report: Hydrogen-Solar Energy System, DoE Project XL 9181681, August 1989.
48. Final Report on Textile and Tapestry Industries Waste Treatment, NSF International Research Project, NSF INT 8520198.
49. Final Report on Fluid Dynamical Models for Determining Wind Characteristics and Their Application in Pakistan, NSF Project INT-8709973.
50. "Solar Hydrogen Energy System as a Permanent Energy Infrastructure," U.S.-Pakistan Symposium on Silicon Technology, Islamabad, Pakistan, May 1993.
51. "Comparison of Solar Hydrogen Energy System with the Fossil Fuel System," U.S.-Pakistan Symposium on Silicon Technology, Islamabad, Pakistan, May 1993.
52. "Hydrogen Energy System and Environmental Benefits," Tatarstan Academy of Science, Kazan, Russian Federation, June 1993.
53. "Global Environmental Problems and Clean Energy Solution," International Conference on New Energy Systems and Conversions, Yokohama, Japan, July 1993.
54. "Optimal Clean Energy: Hydrogen Energy System," National Clean Energy Symposium, Istanbul, Turkey, December 1993.
55. "Hydrogen: The Ultimate Fuel and Comparison with Fossil Fuels," jointly with F. Barbir, U. S. Geological Survey Conference on Energy Gases Proceedings, 1993.

## **SCIENTIFIC AND PROFESSIONAL SOCIETIES**

### **EDITORIAL RESPONSIBILITIES:**

Editor, International Journal of Hydrogen Energy  
Editorial Advisory Board for Advances in Transport Processes, McGill University, Department of Chemical Engineering, Montreal, Quebec, Canada  
Member, Advisory Board, Energy Review  
Editor-in-Chief, International Journal of Energy, Environment, Economics  
Member, International Editorial Board, International Energy Foundation  
Editor-in-Chief, International Board of Hydrogen Energy, Elsevier Science  
Editor with Svetlana Yu. Zaginaichenko, Dmitry V. Schur, B. Baranowski, Anatoliy P. Shpak and Valeriy V. Skorokhod, Hydrogen Materials Science and Chemistry of Carbon Nanomaterials, published in 2004, NATO Science Series, Kluwer Academic Publishers.

### **PROFESSIONAL AND HONORARY ORGANIZATIONS**

International Association for Hydrogen Energy, President  
British Institution of Mechanical Engineers, Fellow  
American Society of Mechanical Engineers, Fellow  
American Association for the Advancement of Science, Fellow  
American Institute of Aeronautics and Astronautics, Member  
American Nuclear Society, Member  
American Association for University Professors, Member  
American Society for Engineering Education, Member  
Society of Sigma Xi, Member  
Society of Engineering Science, Member  
Technical Review Board, Energy Planning Service Division of Petroconsultants, Member  
Omicron Delta Kappa, Laurel Crowned Circle, Tapee Member  
Association of Energy Engineers, Member  
International Association for Housing Science, Member  
Society of Heat Science and Technique, Member  
Turkish Physical Society, Member  
Association for Scientific and Technical International Cooperation, Member  
Manpower Education and Research Training Committee, Member  
American Nuclear Society, Florida Section, Member, Membership Committee  
World Constitution and Parliament Association, Commission on Energy, Chairperson  
Society of Turkish Architects, Engineers and Scientists, Board of Directors, Honorary Member  
Advisory Committee of the International Energy Foundation, Member  
Referee Directory for Research Support System, Kuwait University  
Dirasat Hundasia Journal, United Arab Emirates University, Reviewer  
Head and Select U. S. Delegation, American National Standards Institute (official counterpart - United Nations International Standards Organization)  
Reviewer for Tennessee Technological University  
Consultant, United Nations Industrial Development Organization

## **HONORS AND AWARDS**

Certificate of Merit for Distinguished Service in Heat Transfer between Surfaces in Contact, Dictionary of International Biography, London, England, 1969.

Turkish Presidential Science Award, 1975.

Medal of City of Paris, in recognition of lecture on "Hydrogen Energy System and its Implications," at the Second International Congress on Hydrogen in Metals, Paris, France, 1977.

Honorary Professorship by Ministry of Education of the People's Republic of China, 1981.

I. V. Kurchatov Medal - Kurchatov Institute of Atomic Energy for Contributions to Energy Research in General, and Hydrogen Energy Research in Particular, Moscow, USSR, 1982.

Who's Who in Technology Today, 1982.

Energy for Mankind Award, Global Energy Society for Eradication of Poverty and Hunger, 1986.

Superior Service to Science Award, Turkish Ministry of Culture, Istanbul, Turkey, 7 June 1991.

Membership Award: American Nuclear Society, in recognition of 25 years of continuous membership and with sincere appreciation of valuable contributions made during this period of membership, which have helped materially in enabling the Society to experience sound growth and make notable progress in accomplishing its goals and objectives.

1995 Annual ATAS Science Award, Washington, DC, 21 January 1995.

Phi Beta Delta, Distinguished Scholar Award, 3 April 1996.

Charter Life Member, The Association of Energy Engineers – 1998.

Honorary Doctorate for work on Hydrogen Energy - conferred by the Senate of the Anadolu University, Eskisehir, Turkey, on the occasion of the 40<sup>th</sup> Anniversary of their establishment, 20 October 1998.

Member – University of Miami Society of University Founders – 28 January 1999.

Nominated for the Nobel Prize in Economy by the Azerbaijan Academy of Sciences, for both envisioning the Hydrogen Economy and striving towards its realization, 21-24 September 2000.

Honorary Editor-in-Chief, The International Journal of Sciences and Engineering: Research and Applications (IJSE/RA), March 2001.

Honorary doctorate from the Donetsk State Technical University, Donetsk, Urkraine, for contributions to the development and consolidation of hydrogen energy efforts throughout the world, as well as the beneficial cooperation with the Donetsk University, March 2001.

Honorary Editor-in-Chief, International Scientific Journal for Alternative Energy and Ecology (ISJAE), March 2002.

The Johnson A. Edosomwan Scholarly Productivity Award 2004

## **ACADEMICS**

Subjects or Courses Taught During the Most Recent Academic Year:

MEN 310 Heat Transfer; MEN 602 Advanced Heat Transfer Convection

Other Assigned Duties Performed During the Academic Year:

Director, Clean Energy Research Institute

Research on Two-Phase Flow Instabilities

Research on Hydrogen Energy

Academic Advisor

Proposal Reviewer for N.S.F. & U.S. Civilian R & D Foundation

Paper Reviewer for Int. J. Heat & Mass Transfer and Int. J. Energy Conversion.

Represent U.M. at the Florida Solar Energy Center

Member, CoE Research Council

Member, CoE Strategic Planning Committee

Chair, Search committee for Aerospace/Controls Faculties.

Member, CAE Dept. Environmental Engineering Committee.

## **TEACHING SPECIALIZATION**

Heat Transfer, Nuclear Engineering , Energy Engineering , Hydrogen Energy.

Undergraduate Level:

Thermodynamics, Dynamics, Strength of Materials, Heat Transfer, Mechanical Engineering Laboratories.

Graduate Level:

Nuclear Engineering, Transport Phenomena, Advanced Heat Transfer - Convection, Advanced Dynamics, Advanced Strength of Materials, Solar Energy, Advanced Heat Transfer - Conduction and Radiation.

## **RESEARCH PERFORMED**

Study of Application of Remote Sensing to Detecting Thermal Pollution (feasibility study), 9/1/73-12/31/73, NASA, PI \$27,430.

Study of Application of Remote Sensing to Detecting Thermal Pollution (follow-up of above), NASA, PI \$50,000.

The Hydrogen Economy Miami Energy (THEME) Conference, 2/15/74 - 1/31/75, NSA and DARPA, CPI \$9,900.

Ocean Thermal Research Conference & Workshop, 8/1/75 - 7/31/76, NSF, CPI \$24,000.

Application of Remote Sensing for Prediction & Detection of Thermal Pollution, 9/1/74 - 8/31/75, NASA, PI \$105,000.

Seminar on Key Technologies for the Hydrogen Energy System, 4/1/75 - 9/30/75, NSF, PI \$11,400.

Survey of Hydrogen Production & Utilization Methods, NASA, PI \$179,628.

Development of Boilers & Condensers for Solar Sea Power Plants, 1/1/75 - 1/1/76, NSF, PI \$170,877.

Key Technologies for the Hydrogen Energy System (Scientific Seminar), U. S. Japan Cooperative Science Program, 1/1/73 - 1/1/74, NSF, PI \$511,414.

Solar Cooling and Heating of School Buildings, 6/1/75 - 6/30/77, ERDA/DJOE, PI \$224,652.

IPA Agreement (Chen), 4/1/76 - 9/30/76, ERDA/DOE, PI \$27,363.

IPA Agreement (Harrenstein), 12/1/76 - 11/30/77, ERDA/DOE, PI \$78,708.

IPA Agreement (Chen), 9/1/75 - 3/1/76, ERDA/DOE, PI \$28,125, 3/1/76 - 3/31/76 ERDA/DOE PI \$4,452.

Workshop on Two-Phase Flow & Heat Transfer Research & Applications, 10/17/76 - 12/31/76, NSF, PI \$9,000.

1st World Hydrogen Energy Conference, 11/1/75 - 10/31/76, ERDA/DOE, PI \$24,141.

Two-Phase Flow Transient Instabilities, 4/15/76 - 4/15/78, NSF, PI \$109,900.

Investigation of Using Data from Heat Capacity Mission to Map Thermal Effluents in Lakes and Bays, 9/1/76 - 12/31/77, NASA, PI \$69,434.

Energy-Related Graduate Traineeships for 1976-77, 9/1/76-5/31/79, NSF, PI.

Progress in Hydrogen Energy - U.S.-Australia, NSF, PI.

Final Research Proposal: Systems Dynamics Study of a Universal Hydrogen Energy System, 8/15/76 - 8/15/78, ERDA/DOE, PI \$260,120.

OTEC Conference, 7/1/77 - 1/31/79, ERDA/DOE, PI \$24,543.

Two-Phase Flow Transient Instabilities, 4/1/77 - 4/30/79, NSF, PI \$109,900.

Workshop on Solar Energy (Egypt), 7/1/77 - 6/30/79, NSF, PI \$25,520.

Alternative Energy Sources Conference, 5/1/77 - 10/31/78, ERDA/DOE, PI \$36,556.

Status of Hydrogen Compressor Technology, 9/15/77 - 1/31/79, ERDA/DOE, PI \$30,000.  
IPA Agreement (Harrenstein), 12/1/76 - 11/30/77, ERDA/DOE, PI.

Solar Direct Energy Conversion at Sea, 1/1/78 - 6/30/79, ERDA/DOE, PI, \$178,954.

Thermal Contact Conductance of Multi-Layered Electrically Insulated Sheets, 4/1/78 - 9/30/79, NSF, PI \$89,953.

Magnetic Fusion Power Utilization through a Hydrogen Energy System, 1/1/78 - 12/31/79, ERDA/DOE, PI \$314,041.

U.S.-Japan Cooperative Science Program, 1/1/78 - 12/31/79, NSF, PI \$43,004.

Survey of University Research Potentials re ERDA's Mission, 1/1/77 - 6/30/78, ERDA/DOE, PI \$198,350.

Multi-Phase Flow & Heat Transfer Research & Applications Workshop, 1/1/79 - 12/31/79, ONR, PI \$9,968.

Multi-Phase Flow and Heat Transfer Research & Applications Workshop, 2/25/79 - 4/30/80, NSF, PI \$14,985.

Report on Commercialization of Solar and Conservation Technologies Symposium-Workshop, DOE, PI \$15,000.

Two-Phase Flow Instabilities and the Effect of Inlet Subcooling, NSF, PI \$8,539.

CAPPI Support of FACE 1979 Program, NOAA NA 80-RA COOO107, 4/1/79 - 9/30/79, \$41,991.

Characterization and Environmental Studies of ERDA's Anaerobic Digestion Facility at Pompano Beach, DOE, 8/1/78 - 7/31/79, \$322,977.

Cairo Workshop on Solar Energy, NSF INT77-14182, 7/1/77 - 12/31/79, \$63,820.

A Special Training Course on Tropical Cyclone Hydrology and Flood Forecasting, EMV 020, 1/1/80 - 5/31/80, \$22,000.

Utilization of Digitized Radar Rainfall Data to Calibrate Satellite Rainfall Measurements, ONR NOOO14-75CO172, 11/1/79 - 10/31/82, \$105,000.

Two-Phase Flow Instabilities and the Effect of Inlet Subcooling, NSF, PI \$12,097.

Two-Phase Flow Instabilities, NSF C254-79, Rev. 1, \$129,000.

Global Report on the State-of-the-Art of Passive and Hybrid Cooling, SSEC, \$64,087.

Development of Alternative Energy Science and Engineering in the Caribbean, 3/1/82 - 8/31/82, UNICA, \$12,150.

4th Miami International Conference on Alternative Energy Sources, DARPA, 10/1/81 - 9/30/82, PI \$14,908.

Multi-Phase Flow & Heat Transfer Symposium-Workshop, NSF, 6/1/82 - 12/31/83, PI \$18,964.

Tropical Meteorology & Hurricane Forecasting, DOE, 1/1/82 - 6/30/82, \$30,000.

Radar/Satellite Rainfall Measurement, Navy-ONR, 11/1/81 - 1/31/83, \$40,000.

U.S.-Pakistan Symposium-Workshop on Renewable Energy Sources, NSF, 8/15/82 - 1/31/84, PI \$90,260.

Boiling Flow Instabilities in Parallel Channels with Enhanced Heat Transfer, NSF 7/1/83 - 12/31/86, \$258,751.

Miami Beach Convention Center Solar Cooling System Proposal Development, Miami Beach City Council, 8/1/83 - 9/30/85, \$17,290.

Symposium-Workshop on Remote Sensing Fundamentals and Applications, NSF, 8/1/84 - 7/31/86, \$15,556.

International Symposium-Workshop on Particulate and Multi-Phase Processes, NSF, 11/1/84-2/28/86, \$19,319.

U.S.-Spain Workshop on Renewable Energy Sources, NSF, 9/27/85 - 8/31/86, \$13,260.

Access to Class VI Computer Systems, NSF, 7/1/85 - 12/31/86, \$19,400.

U.S.-Jamaica Research Oriented Workshop on Materials Science and Energy, NSF, 3/16/87 - 3/15/88, \$10,000.

Two-Phase Flow Instabilities, NSF, 1/1/87 - 6/30/90, \$157,325.

Fluid Dynamical Models for Determining Wind Characteristics & Their Application in Pakistan, NSF, 7/1/87 - 8/31/90, \$63,000.

Solar-Hydrogen Energy System, Department of Energy, 9/1/88 - 11/30/97, \$2,087,000.

Internship Program on Renewable Energy Sources, Institute of International Education, 3/1/91 - 2/29/92, \$9,500

Internship Program on Thermal Power, United Nations, 3/1/91 - 2/29/92, \$7,756.

U.S.-Australia Joint Seminar on Enhanced Thermal Conductance, NSF, 11/1/91 - 10/31/92, \$29,470.

U.S.-Pakistan Joint Research on Advanced Renovation of Small Industry Wastes, NSF, 2/15/92 - 1/31/93, \$10,000.

U.S.-China Research on Two-Phase Flow, NSF, 6/1/92 - 5/31/94, \$9,600.

U. S. -Pakistan Workshop on Silicon Technology, NSF, 3/1/92 - 2/28/94, \$20,000.

Oil Spill Mechanical Recovery Systems Investigation, University of Miami, 1993, \$70,000.

U.S.-India Symposium-Workshop on Remote Sensing Fundamentals and Applications, NSF, 6/1/94 - 5/31/96, \$22,191.

U.S.-Pakistan Cooperative Research on Photovoltaic Hydrogen Production, NSF, 5/31/94 - 6/30/97, \$55,253.

U.S.-India Cooperative Research on Optimum Industrial Complexing, NSF, 9/1/94 - 8/31/97, \$102,415

Encyclopedia of Life Support Systems Bahamas Workshop, Encyclopedia of Life Support Systems, 10/25/95 - 12/31/97, \$61,665.

U.S.-Pakistan Symposium-Workshop on Silicon Technology, NSF, 9/1/97 - 8/31/98, \$17,105.

U.S.-Pakistan Cooperative Research on Sustainable Homestead, NSF, 3/1/99-2/28/02, \$30,900.

U.S.-Egypt Cooperative Research on Assessment and Optimization of Annual Performance of Solar PV H2 Energy Systems, NSF, 9/15/00-8/31/02, \$23,000.

## **THESIS AND DISSERTAION ADVISING**

M. S. Chairman

W. Callahan

Two-Phase Flow Instabilities

1965

M. S. Chairman	T. Wang Boiling Flow Oscillations in Freon 11	1966
M. S. Chairman	D. A. Meyer Instabilities in Boiling Water Flow	1967
M. S. Chairman	F. Hettinger The Application of Cryogenics to a Self-Contained Underwater Breathing System	1967
M. S. Member	C. Cheng Hypersonic Flow Past a Wedge in Magnetohydrodynamics	1968
M. S. Chairman	J. M. Martinez Instabilities in Upward Boiling Flow	1968
M. S. Member	R. Church Consideration of Boundary Layer Effects in Coanda Flow About a Circular Cylinder	1968
M. S. Member	J. Jenkins An Investigation of the Resources in a Concentric Cylindrical Laser Cavity	1968
M. S. Chairman	W. Wang Boiling Water Instabilities in a Two Parallel Channel Upflow System	1969
M. S. Chairman	N. Bhandari Statistical Study of Thermal Contact Conductance	1969
M. S. Member	E. Oner Electrochemical and Thermoelectric Response of Ag/Ag <sub>1</sub> /Ag Arroyo	1969
M. S. Chairman	T. R. Sehgal Boiling Water Flow Instabilities in a Cross-Connected Parallel Channel System	1969
Ph. D. Member	R. Wagstaft Higher Order Effects in Laminar	

M. S. Chairman	Boundary Layer Theory for Curved Surfaces	1970
M. S. Chairman	M. Malhotra Effect of Cross-Flow Mixing on Boiling Flow Instabilities in Parallel Channels	1970
M. S. Member	R. M. Hall, Jr. Thermal Conductance and Conductivity of Closed Cell Neoprene Foam Under Hydrostatic Pressure	1970
M. S. Member	G. J. Daily Heat Transfer from a Translating Kerosene Droplet in Water	1970
M. S. Chairman	R. J. Aldaire Thermal Contact Conductance of Spherical Contacts	1971
M. S. Member	S. Chern A Numerical Evaluation of the Effect of Axial Conduction Upon Heat Transfer at Low Peclet Number with Variable Heat Flux	1971
M. S. Chairman	J. F. Morlock Water Intrusion of Closed Cell Neoprene Foam Under Hydrostatic Pressure	1971
M. S. Chairman	R. M. Jones Heat Transfer from Heat Sources Buried in Ocean Bed	1971
M. S. Member	L. N. Phu The Effect of Suction Slot on the Separation Point of Laminar Flow Over Curved Surfaces	1971
Ph. D. Member	B. W. Morrow Application of the Spectrum Inversion Technique to the Vibration Analysis of a Build-Up Plate	1971
M. S. Chairman	E. Y. Denker Boiling Flow Instabilities in Four	

	Parallel Channels	1971
M. S. Chairman	H. Yüncü Effect of Interstitial Plates and Contact Pressure on Thermal Contact Conductance	1971
M. S. Chairman	A. Tepebag The Effect of Contact Pressure and Contact Surface Orientation on the Thermal Contact Conductance of Similar Metals	1971
M. S. Chairman	B. V. Lyon Transient Instabilities in Cross Connected Two Parallel Channel Boiling Flow	1972
M. S. Member	T. A. Thomas, Jr. Methods of Internal Imaging	1973
M. S. Chairman	Y. Alp Transient Boiling Flow Instabilities in Four Parallel Channels	1973
M. S. Chairman	H. B. Aksu Boiling Flow Instabilities in a Four Parallel Channel Upflow System	1973
M. S. Chairman	G. Goldmark Thermal Conductance of Bolted Lap Joints	1973
M. S. Chairman	D. B. Denham The Effect of Deflection Blade Spacing on Heat Transfer from Open Channels	1973
M. S. Member	M. R. Swain Hydrogen-Air Internal Combustion Engine	1973
Ph. D. Chairman	H. Yüncü Thermal Conductance of Laminated Contacts	1974
M. S. Chairman	N. Thinh	

M. S. Chairman	Heat Transfer to Upward Boiling Flow	1974
M. S. Chairman	K. Civci Effect of Electroplating on Thermal Contact Conductance	1974
M. S. Chairman	O. T. Baser A World Model for Transition to a Hydrogen Fuel System	1974
D. A. Chairman	J. P. Alexander Air Pollution Control Technologist Training Program	1974
D. A. Chairman	R. J. Leonard Planning and Financing Physical Environment to Meet Changing Needs of Higher Education	1975
M. S. Chairman	S. A. Memon Investigation of Hydrogen Production by Thermochemical Processes	1975
M. S. Chairman	D. C. Rona Remote Sensing of Turbidity in Near Shore Environment	1976
Ph. D. Chairman	N. Forouzanmehr Three World Regions and a Universal Hydrogen Energy System	1977
Ph. D. Chairman	P. Nayak Thermal Contact Conductance	1977
Ph. D. Chairman	T. Dogan Lumped Parameter Analysis of Two-Phase Flow Stabilities	1979
Ph. D. Chairman	N. Ozboya Solution of Three Dimensional Discontinuous Flow Past an Obstacle by Method of Singularities	1979
Ph. D. Chairman	K. Akyuzlu Numerical Simulation of Density-Wave and Pressure-Drop	

	Type Oscillations in Two-Phase Flow Upflow Systems	1979
Ph. D. Chairman	I. Lead Hydrogen Energy System for Brazil	1979
D. A. Chairman	S. Ridenaur Passive Methods of Energy Conservation (Project)	1979
Ph. D. Member	C. Lee	1979
Ph. D. Member	T. Anzal	1980
Ph. D. Chairman	A. R. Hussain	1982
Ph. D. Chairman	H. Gurgenci Two-Phase Flow Instabilities	1982
Ph. D. Chairman	T. M. K. Kurdi Energy Studies	1983
M. S. Member	A. Alloush (Comprehensive)	1983
M. S. Member	N. Camejo Coastal Zone Management	1983
M. S. Member	R. Lira Marine Biofouling Control by Means of Targeted Chlorination	1983
D. A. Member	S. Yetimoglu Fiber Reinforced Concrete	1984
M. S. Member	O. E. Atesoglu	1985
Ph. D. Chairman	A. Mentes Two-Phase Flow Instabilities	1985
Ph. D. Chairman	I. Gurkan Greenhouse Effect	1985
M. S. Chairman	F. Maia A Radiation Trap for a Novel Design for Flat Plate Collectors	1985

M. S. Chairman	Amado Erol Hydrogen Energy	1985
Ph. D. Member	O. T. Yildirim Numerical & Experimental Study of Two-Phase Flow Instabilities in Parallel Channels	1986
Ph. D. Chairman	W. El-Osta Solar-Hydrogen Energy System for a Libyan Coastal Country	1986
Ph. D. Chairman	G. Eljrushi Solar Hydrogen Energy System Model for Libya	1986
M. S. Chairman	M. Blanco Photovoltaic Hydrogen Systems for Electricity Generation, Storage & Distribution	1986
Ph. D. Chairman	M. Keita Supervise Doctoral Dissertation in Physics	1986
M. S. Chairman	S. Muradoglu Non-Thesis Option	1987
D. A. Chairman	I. Wagner Hydrogen Energy	1987
M. S. Member	Z. Y. Kakaç M. S. M. E. Heat Transfer	1987
M. S. Member	S. Al-Ajlan Future Saudi Arabian City Planning Based on the Use of Solar-Hydrogen Energy	1988
Ph. D. Member	W. Li Transient Turbulent Forced Convection	1988
M. S. Chairman	N. Lutfi Study on Solar-Hydrogen Production Methods and Their Comparison	1988

Ph. D. Member	M. Swain Computer Modeling of Various Fuel Preparation Methods in a Methanol Fueled Engine	1988
M. S. Chairman	A. T. Tekindur Capstone Project: Cross Flow Pressure Drive Membrane Separation Operations on Industrial Waste Waters	1988
Ph. D. Chairman	M. Padki Two-Phase Flow Thermal Instabilities	1989
D. A. Chairman	M. J. Torres Cost Comparison of Fossil Fuels with that of Clean Hydrogen Energy	1989
Ph. D. Chairman	N. Lutfi Solar-Hydrogen Energy System for Pakistan	1990
M. S. Chairman	S. M. Rainey Computer Modeling and Comparison of Hydrogen-Fueled and Methane-Fueled Hypersonic Vehicles	1990
M. S. Member	T. Ozgokmen Fluid Dynamical Models of Wind Field Over Non-Uniform Terrain	1990
M. S. Member	M. Syed A Thermodynamic & Economic Analysis of a Hydrogen Liquefaction System	1990
M. S. Member	A. S. Vaishnav Thermal Fluid	1990
M. S. Member	T. M. Srinivasan Thermal Fluids	1990
Ph. D. Member	Z. Dulger Numerical Simulation of Heat Release and Flame Propagation for Methane Fueled I. C. Engines with Hydrogen Addition	1990

M. S. Member	M. J. Yusuf In-Cylinder Flame-Front-Growth Measurement of Methane and Hydrogen-Enriched Methane Fuel in a Spark-Ignited Internal Combustion Engine	1990
Ph. D. Member	L. I. Kazi Infrared & Visible Studies of Pakistan Portion of Arabian Sea Using INSAT Geostationary Satellite	1991
Ph. D. Chairman	F. Barbir Modeling of the Hydrogen Energy System	1991
M. S. Member	S. Gursu Analysis of Cryogenic Hydrogen Storage Systems	1991
M. S. Member	M. Lordgooie Computation of Fluid Dynamics	1991
Ph. D. Member	J. Huang Quantitative Analysis of 3-D Steady Flow Field by Using Particle Image Velocimetry and Digital Image Processing Method	1991
M. S. Chairman	F. Oney The Comparison of Pipelines Transportation of Hydrogen and Natural Gas	1991
M. S. Member	M. Akcin Manual Material Handling	1991
Ph. D. Member	A. Ur-Rahman Malik Surface Radar Studies of Rain Estimation in Correlation with Infrared and Visible Techniques of INSAT and GOES-E Geostationary Satellites	1992
Ph. D. Chairman	K. R. Agha Solar Power Generation & Storage	1993

M. S. Member	F. Calisir	1993
Ph. D. Co-Chairman	L. Zhang Analytical Investigation of Magnetic Refrigeration Systems for Hydrogen Liquefaction	1993
M. S. Member	K. Yao Boiler Combustion Analysis and Environmental Impact Using Exergy Method	1993
Ph. D. Member	M. J. Yusuf Lean Burn Natural Gas Fueled Engines: Engine Modification vs. Hydrogen Blending	1993
M. S. Co-Chairman	A. Mandi A Study of Hydrogen-Hydride Heating/Cooling System to Replace Chlorofluorocarbon (CSF) System and Their Comparison	1993
Ph. D. Co-Chairman	A. S. Vaishnav Dispersion of Hydrogen in Air in Vented 3-D Enclosures	1993
M. S. Member	N. J. Paradiso, Jr.	1993
Ph. D. Member	D. Ghosh	1993
Ph. D. Member	H. Liu Pressure Drop Type and Thermal Oscillations in Convective Boiling Systems	1993
M. S. Chairman	K. Kocer Liquid Hydrogen Powered Commercial Aircraft	1994
Dipl. Engr. Project	K. Hollenbach	1994
Ph. D. Member	S. Ratana-Aporn	1994

M. S. Member	M. A. Waheed Techniques in Satellite Measurements of Rainfall and Soil Moisture	1995
Ph. D. Member	D. M. Brown Theoretical and Experimental Analysis of Unsteady Forced Convection in Circular Ducts	1995
Ph. D. Member	H. Kabadayi	1995
M. S. Member	M. Arik An Investigation into Single Phase Forced Convection Turbulent Flow Inside Rectangular Channels	1995
M. S. Chairman	S. V. Krishnan	1996
M. S. Member	Subrahmanyam Saripalli	1996
Ph. D. Member	Ayoub M. A. Kazim	1996
Ph. D. Chairman	Jeffry Padin	1997
Ph. D. Member	Kamaruzzaman Bin Sopian	1997
Ph. D. Member	Vladimir Guam	1997
Ph.D. Member	Guangbin He	1999
Ph.D. Member	Liping Cao	1999
M.S. Member	Ekathai Wirojsakunchai	2000
Ph.D. Member	Lixin You	2001
Masters Member	Patrick Filoso	2003
Masters Member	Lin Wang	2003
Masters Member	Chakradhar Lingamgunta	2003
Ph.D. Chairman	Kor Özay	2004
Masters Member	Cristhian Quintanilla-Aurich	2004

## **LIAISON WITH HIGH SCHOOL PROGRAM**

John Parsons	1980-1981
David F. Mackay	1981-1982
Joseph Eskanzi	1982-1983

## **EXTERNAL EXAMINER**

Ph. D.	N. Idrus	Australia 1980
M. S.	Z. B. Seid	Egypt 1983
Ph. D.	A. Jagadeesh	India 1985
Ph. D.	S. El-Toukhy	Egypt 1986
Ph. D.	T. Kiatsiriroat	Thailand 1986
Ph. D.	F. Tran	Canada 1986
Ph. D.	L. M. Acharya	India 1987
Ph. D.	M. Answar Khan	Pakistan 1988
Ph. D.	P. Khummongkol	Thailand 1989
Ph. D.	S. K. Mishra	India 1990
Ph. D.	Z. I. Shams	Pakistan 1990
Ph. D.	K. R. Marpu	India 1990
Ph. D.	H. J. Singh	India 1991
Ph. D.	Mrs. Farzana	India 1991
Ph. D.	J. A. Nijangaya	India 1991
Ph. D.	K. Chand	India 1992
Ph. D.	V. K. Agarwal	India 1993
Ph. D.	M. N. Mungole	India 1994
Ph. D.	A. M. Ray	India 1995
Ph. D.	B. K. Choudhury	India 1995
Ph. D.	A. K. Singh	India 1997
Ph.D.	Mohammed AbuShaz	India 2001

## **COLLABORATION WITH VISITING SCIENTISTS**

Zonghu Lin - P. R. China  
Aghareed Tayeb - Egypt - Academic Advisor  
A. A. El-Bassuoni - Egypt - Research Project  
Arthur Williams - Australia - Research Project  
Sadik Kakaç - Turkey - Research Project  
Danzhi Chen - P. R. China  
Jin-hua Jin - P. R. China  
Visiting Researcher - A. H. Awad - Nigeria  
Visiting Researcher - Omer B. Tek - P. R. China

Visiting Professor - Shun-Lun Shieh - P. R. China  
Visiting Researcher - Yurdogul Kakaç - Turkey  
Visiting Researcher - Lin Chen - P. R. China  
Visiting Researcher - Ahmed Nkodia - Congo  
Visiting Researcher - Tzonu Petkov - Bulgaria  
Visiting Researcher - Josef Zubr - Denmark  
Visiting Researcher - Zhou Fang - P. R. China  
Visiting Researcher - Cem Sorusbay - Turkey  
Visiting Researcher - Tingquan Chen - P. R. China  
Visiting Researcher - K. Svanholm - Norway  
Visiting Researcher - Chun-Lun Shieh - P. R. China  
Visiting Researcher - Lonquan Lin - P. R. China  
Visiting Researcher - Kemal Altinisik - Turkey  
Visiting Researcher - Sergio S. Stecco - Italy  
Visiting Researcher - Huanyi Zhang - P. R. China  
Visiting Researcher - Albina de Souza - Brazil  
Visiting Researcher - Renato M. Cotta - Brazil  
Visiting Researcher - A. Jagadeesh - India  
Visiting Researcher - Andre Chuveliov - Russia  
Visiting Researcher - Atiq Mufti - Pakistan  
Visiting Researcher - M. A. A. Beg - Pakistan  
Visiting Researcher - A. Q. Malik - Pakistan  
Visiting Researcher - S. N. Mehmood - Pakistan  
Visiting Researcher - Xuejun Chen - P. R. China  
Visiting Researcher - B. Yuksel - Turkey  
Visiting Researcher - Orhan Ozbay - Turkey  
Visiting Researcher - Ravshan S. Mukhamedov - Russia  
Visiting Researcher - Lutero Carma de Lima - Brazil  
Visiting Researcher - Sher Mohammed Khan - Pakistan  
Visiting Researcher - Xiorang Wei - P. R. China  
Visiting Researcher - Klaus Hollenbach - Germany  
Visiting Researcher - Hua-tang Yuan - P. R. China  
Visiting Researcher - Kadri Suleyman Yigit - Turkey  
Visiting Researcher - Abdul Halim Shamsuddin - Malaysia  
Visiting Researcher - Tapan Chakrabarti - India  
Visiting Researcher - Alfonso Contreras - Spain  
Visiting Researcher - Carl-Jochen Winter - Germany  
Visiting Researcher - Byeong Soo Oh – Korea  
Visiting Researcher - Ishak Kotcioglu - Turkey  
Visiting Researcher - Yuksel Kaplan – Turkey  
Visiting Researcher - Ayda Athanazio - Brazil  
Visiting Researcher – Dr. Selahattin Akansu (Turkey)  
Visiting Researcher – Robert Amicone (Italy)  
Visiting Researcher – Simone Curti (Italy)  
Visiting Researcher – Enis Fakioglu (Turkey)  
Visiting Researcher – Dr. Yury Nechaev (Russia)

## **UNIVERSITY COMMITTEE AND ADMINISTRATIVE RESPONSIBILITIES**

School Council - School of Engineering & Environmental Design, Univ. of Miami, 1966-1969.  
Academic Planning Committee, University of Miami, 1967-1970.

Member, Research Faculty, 1969-Present.

Graduate Council, University of Miami, 1970-1973.

Search Committee for Dean of Engineering, Chairman, 1971-1972.

Senate Committee on Interdisciplinary Activities, Chairman, 1972-1973.

Research Council, 1973-Present.

Self-Study Committee, 1974-1975.

Sponsored Programs Coordinating Committee, 1975.

Chairman, Task Force on Energy, 1975.

Member, Patent and Copyright Committee, 1979-Present.

Member, Energy Conservation Committee, 1978.

Member, Excess Equipment Committee, 1979-Present.

Member, Committee on International Technology Transfer & Education, 1979-Present.

Member, Fluid Mechanics Committee, 1979-1980.

Member, Design Curriculum Committee, 1979-1980.

Member, Graduate Council, 1979-1982.

Member, Space Committee, 1979-1980.

Member, Committee for Graduate Courses on Energy, 1979-Present.

Faculty Advisor, Association for Turkish Students, 1980-Present.

Council for University of Miami, ORAU (Oak Ridge Associated Universities), and member of ORAU Administration & Policy Committee, 1982-Present.

Member, Manpower Education Research & Training Committee, ORAU, 1986-Present.

Energy-Environment Systems Steering Committee, ORAU, 1989-Present.

Chairman, Search Committee, Faculty Position in Fluids-Heat Transfer, 1982.

Coordinator for International Affairs, 1983-Present.

Judge of ASEE Research Paper Competition, 1983.

Chairman, Search Committee, Chairman Position, Industrial Engineering Department, 1984.

Co-Chairman, Patent & Copyright Committee, 1985.

Member, Self-Study Committee Graduate Programs and Research, 1985-1986.

Member, 60th Anniversary Celebrations Committee, 1986.

Chairman, Search Committee, Chairman of Biomedical Engineering.

Chairman, Search Committee, Chairman of Electrical Engineering.

Member, College of Engineering Research Council, Advisory Capacity to Dean

Member, Solar/HVAC Laboratory Committee.

Member, Search Committee, Staff, Mechanical Engineering.

President, Silver Club.

Chairman, Search Committee, Faculty Position in Controls/Dynamics and Dynamical Systems, 1995.

Search Committee, Faculty Position in Materials Science, 1996.

## **COMMUNITY ACTIVITIES**

Dade County Public School Systems University Science Program, Supervisor 1965 - Present.  
Dade County Science Fair Engineering Exhibits Judging Committee, Member, 1966-1967.  
Learning Disabilities Foundation, Board Member, 1970-Present.  
Learning Disabilities Foundation, Vice-President, 1971-1972.  
Learning Disabilities Foundation, President, 1972-1973.

## **OTHER PROFESSIONAL INFORMATION OR ACTIVITIES**

Organization Committee, American Nuclear Society, Winter Annual Meeting, 1971.

Organization Committee, American Society of Mechanical Engineers, Regional Student Administrative Conference, 1972.

Co-Chairman, The Hydrogen Economy Miami Energy (THEME) Conference, Washington, DC, 22-26 September 1974.

Organization Committee, Ocean Thermal Energy Conversion Workshop, Washington, DC, 26-28 September 1974.

Organizations Committee, Florida/Sunshine State Research Visit of the National Science Foundation Solar Energy/Transportable Research Laboratory, 4 November - 7 December 1974.

Co-Chairman, Remote Sensing Applied to Energy-Related Problems Symposium-Course, Miami, FL, December 1974.

Organization Committee, Co-Chairman, Hydrogen Energy Fundamentals, Symposium Course, Miami Beach, FL, 3-5 March 1975.

Organization Committee, The Time of Exhaustion of the Fossil Fuels, with Dr. J. O'M. Bockris, University of Miami, Coral Gables, FL, 28 March 1975.

Organization Committee, U. S. Naval Reserve Special Officers Seminar on the Energy Crisis, 9-11 June 1975.

Co-Chairman, Introduction to Hydrogen Energy Symposium, Maracay, Venezuela, 6-11 October 1975.

Organization Committee, Energy Conservation Forum, Ft. Lauderdale, FL, 1-3 December 1975.

Chairman, First World Hydrogen Energy Conference, Miami Beach, FL, 1-3 March 1976.

Organization Committee, Advanced Study Institute on Two-Phase Flows and Heat Transfer, Istanbul, Turkey, 16-27 August 1976.

Chairman, Two-Phase Flows and Heat Transfer Symposium, Ft. Lauderdale, FL, 18-20 October 1976.

Chairman, Solar Cooling and Heating Symposium, Ft. Lauderdale, FL, 6-8 December 1976.

Organization Committee, Hydrogen Energy on Applications: A Symposium-Course, Puerto Ordaz, Venezuela, 7-11 March 1977.

Organizing Committee, Izmir International Symposium I on Solar Energy Fundamentals and Applications, Izmir, Turkey, 1-5 August 1977.

Co-Chairman, Panel on Nuclear and Unconventional Energy Sources, Tenth World Energy Conference, Istanbul, Turkey, 19-23 September 1977.

Keynote Speaker: Opening of the Hydrogen Homestead, Provo, UT, 10 November 1977.

Invited Lecture, "Ocean Energy Systems," Symposium on Energy and the Oceans, in Cooperation with the Bureau of National Affairs, Inc., Key Biscayne, Miami, FL, 31 October - 1 November 1977.

Chairman, Alternative Energy Sources: A National Symposium, Miami Beach, FL, 5-7 December 1977.

Chairman, Fifth Ocean Thermal Energy Conversion (OTEC) Conference, Miami Beach, FL 20-22 February 1978.

Chairman, First South Florida Symposium on Solar Energy, Miami and Coral Gables, FL, 28 February 1978, and 2 March 1978, respectively.

Co-Chairman, Solar Energy Fundamentals and Applications Symposium-Course, Maracaibo, Venezuela, 7-11 March 1978.

Invited Lecture, "An Energy Intermediate: The Hydrogen Energy System Concept," Symposium on Energy and Development in the Americas, Sociedad Brasiliera para Progreso da Ciencia (SEPC) and the Interciencia Association, Guaruja, S. P. Brazil, 12-17 March 1978.

Keynote Address: "Why Solar Energy?," Symposium-Course on Solar Energy Fundamentals and Applications, Maracaibo, Venezuela, 8-11 March 1978.

Co-Chairman, Symposium-Course on Solar Energy Fundamentals and Applications, Maracaibo, Venezuela, 8-11 March 1978.

Invited Lecture, "Hydrogen Energy System Concept," 14th Annual Southeastern Seminar on Thermal Science, North Carolina State University, Raleigh, NC, 8-11 April 1978.

Invited Lecture, "Hydrogen Energy System Concept and Hydrogen Production Methods," Engineering Seminar at St. Mary's University, San Antonio, TX, 8 April 1978.

Invited Lecture, "Hydrogen Energy System: A Viable Alternative to the Present Fossil Fuel Systems," Joint National Meeting of the Institute of Management Sciences and Operations Research Society of America, New York, NY, 1-3 May 1978.

Invited Lecture, "Ocean Energy System," U. S. Naval Reserve, Special Officers Seminar on Energy Overview, U. S. Reserve Training Center, Coconut Grove, FL, 6 June 1978.

International Taping "Hydrogen Energy System," two talks in English and Turkish, taped for International Technitape Network, Pittsburgh, PA, 7 June 1978.

Organizing Committee, International Symposium-Workshop on Solar Energy, Cairo, Egypt, 16-22 June 1978.

Keynote Address, "Solar Energy in Developing Countries," International Symposium-Workshop on Solar Energy, sponsored by the National Science Foundation, held at the Arab League Building, Cairo, Egypt, 16-22 June 1978.

Invited Lectures, "Hydrogen Energy System Concept," "Solar Hydrogen Energy System and Hydrogen Production Methods," and "Complementary Energy Carriers: Hydrogen and Electricity," Turkiye Elektrik Kurumu, Ankara, Turkey, 26-28 June 1978.

Organizing Committee, Second World Hydrogen Energy Conference, Zurich, Switzerland, 21-24 August 1978.

Keynote Address, "Hydrogen Energy, the Next Step," Second World Hydrogen Conference, by International Association for Hydrogen Energy, held at the Swiss Federal Institute for Reactor Research, Wurenlingen, Switzerland, 21-24 August 1978.

Invited Lecture, "Hydrogen Energy System," University of Delaware, Newark, DE, 27 October 1978.

Invited Lecture, "Hydrogen Energy System," Ridge Chapter, Florida Engineering Society, Lakeland, FL, 9 November 1978.

Chairman, Solar Energy and Conservation Symposium-Workshop, Miami Beach, FL, 11-23 December 1978. Invited Lecture, "Solar Hydrogen Production and Applications of Hydrogen Energy in Buildings," Workshop on Architectural Applications of Solar Engineering, Pigeon Key, FL, 15 December 1978.

Invited Lecture, "Unusual Applications of Hydrogen," and "Steps to Implement the Hydrogen Energy System," Annual Meeting of the HESS Society of Japan, Tokyo, Japan, 8-12 January 1979.

Keynote Address, "Hydrogen Energy System Concept and Engineering Applications," International Conference on Future Energy Concepts, by the Institution of Electrical Engineers, London, England, 31 January 1979.

Chairman, 2nd Multi-Phase Flow and Heat Transfer Symposium-Workshop, Miami Beach, FL, 16-18 April 1979.

Invited Lecture, "An Experimental Investigation of Thermal Contact Conductance of Multilayered Electrically Insulated Sheets," AIAA 14th Thermophysics Conference, Sheraton Twin Towers, Orlando, FL, 4-6 June 1979.

Member, Steering Committee - 7th OTEC, Ocean Thermal Energy for the 80's, Washington, DC, 19-22 June 1979.

Organizing Committee, Izmir International Symposium II on Solar Energy Fundamentals and Applications, Izmir, Turkey, 6-8 August 1979.

Keynote Speaker, "Why Solar Energy?," Izmir International Symposium II on Solar Energy Fundamentals and Applications, Izmir, Turkey, 6-8 August 1979.

Member, Organizing Committee, First International Symposium on Non-Conventional Energy, by the International Centre for Theoretical Physics, Trieste, and the International College on Applied Physics, Catania, Trieste, Italy, 27 August - 21 September 1979.

Interview, "The Energy Crisis: How Well is Our Government Coping?," Veritas, University of Miami, Coral Gables, FL, 27 August 1979 issue.

Keynote Address, "The Next Step in Aviation," International Symposium on Hydrogen and Air Transportation, Stuttgart, Federal Republic of Germany, 10-12 September 1979.

Invited Lecture, "A Hydrogen Energy System," Department of Physics Colloquium, University of Miami, Coral Gables, FL, 11 October 1979.

Invited Lecture, "Hydrogen Energy System," Brazilia, Belo Horizonte, Rio de Janeiro and Porte Allegre, at the invitation of U. S. International Communications Agency, 22-30 October 1979.

Invited Lecture, "Hydrogen Energy System and its Benefits to Horticulture," 92nd Annual Meeting of the Florida State Horticulture Society, Lake Buena Vista, Orlando, FL, 6-9 November 1979.

Chairman, 2nd Miami International Conference on Alternative Energy Sources, Miami Beach, FL, 10-12 December 1979.

Invited Lecture, "Hydrogen Energy System," Alternative Energy Sources for Florida Forum, Miami-Dade Community College, Miami, FL, 1 March 1980.

Organizing Committee, Solar Cooling and Dehumidifying Conference, Caracas, Venezuela, 11-12 March 1980.

Informal Lecture, "Ongoing Research," Physics Department, University of Miami, Computer Center, Coral Gables, FL, 13 March 1980.

Consultant, Florida Solar Energy Center Advisory Committee, Cape Canaveral, FL, 25 March 1980.

Invited Lecture, "Hydrogen Energy System: Energy Infrastructure of the Future," Second Annual Energy Seminar, Gannon University, Erie, PA, 31 March 1980.

Invited Lecture, "Activities of the Clean Energy Research Institute," University of Miami Women's Guild, Coral Gables, FL, 7 April 1980.

Invited Lecture, "Hydrogen Energy System and Unusual Applications of Hydrogen," Seminar at the Politecnico di Torino, Italy, 17 April 1980.

Invited Lecture, "Ocean Thermal Energy: Status and Prospects," International Conference on Solar and Ocean Energy, Milan, Italy, 18-20 April 1980.

Consultant, Media Resource Service on Scientist's Institute for Public Information, May 1980.

Testimony before the Sub-Committee on Energy Development and Applications of the Committee on Science and Technology (U.S. House of Representatives), Gainesville, FL, regarding Florida's energy needs, 15-16 May 1980.

Invited Lecture, "Ocean Energy Systems," Naval Resource Officers Seminar, Coconut Grove, FL, 3 June 1980.

Invited Lectures, "Hydrogen Energy System," "Hydrogen Production Methods," "Applications of Hydrogen," and Instabilities in Boiling Water Reactors and Two-Phase Flow Research in the United States," Quinhua University, Beijing, Jiaotong University, Xian, and Shanghai Jiaotong University, Shanghai, China, 10-21 June 1980.

Keynote Address, "Hydrogen Energy Actions for the 1980's," Third World Hydrogen Energy Conference, Tokyo, Japan, 23 June 1980.

Organizing Committee, Third World Hydrogen Energy Conference, Tokyo, Japan, 23-26 June 1980.

Invited Lecture, "Hydrogen and Environmental Factors in Estimating Fuel Costs," Japan Hydrogen Energy System Society Symposium," Tokyo, Japan, 26 June 1980.

Keynote Address, "Initiation of the Hydrogen Energy System," Third World Hydrogen Energy Conference, Tokyo, Japan, 23-26 June 1980.

Co-Chairman and Invited Lecture, "Hydrogen Energy System," Symposium on the Production and Storage of Hydrogen, Kyoto University, Kyoto, Japan, 28 June 1980.

Television Appearance, "Informal Discussion on the Energy Crisis with Possible Solutions," Something on 17 - Channel 17, Miami, FL, 3 July 1980.

Invited Lecture, "Next Step for a Sunny Future," Ege University, Izmir, Turkey, August 1980.

Scientific Consultant and Lecturer, "Hydrogen Energy System and Solar Hydrogen Production," Cukurova University, Adana, Turkey, August 1980.

Invited Lecture, "Two-Phase Flow Instabilities in Heat Exchangers," Advanced Study Institute on Heat Exchangers, Thermal-Hydraulic Fundamentals and Design, Bogazici University, Istanbul, Turkey, 4-15 August 1980.

Advisory Committee Member, Florida Solar Energy Center, Cape Canaveral, FL, 22 September 1980.

Invited Lecture, "Hydrogen Energy System," Rotary Club, Coconut Grove, FL, 23 September 1980.

Invited Lecture, "Hydrogen Energy System," Kiwanis Club, Coral Gables, FL, 7 October 1980.

Invited Lecture, "Hydrogen Energy System," American Society of Mechanical Engineers, Miami, FL, 30 October 1980.

Invited Lectures, "Hydrogen Energy System Concept," "Hydrogen Production Methods," and "Application of Hydrogen Energy to Homes and Buildings," Argentinean Aerospace Research Center, Buenos Aires, Cordoba and Trelew, Argentina, 20-30 November 1980.

Keynote Speaker, Opening Session, Florida International University's Conference on Energy Research and Conservation Related to the Build Environment, Miami Beach, FL, 8 December 1980.

Chairman, Third Miami International Conference on Alternative Energy Sources, Miami Beach, FL, 15-17 December 1980.

Member, Technical Advisory Committee, International Conference on Energy Resources and the Environment, held in Manila, Philippines, 5-9 January 1981.

Invited Lecture, "The Unifier of Non-Conventional Energy Sources: Hydrogen Energy System," International Conference on Energy Resources and the Environment, held in Manila, Philippines, 5-9 January 1981.

Invited Lecture, "Hydrogen Energy System," Broward County Chamber of Commerce, Ft. Lauderdale, FL, 9 February 1981.

Invited Lecture, "Hydrogen Energy System," Third Annual Energy Seminar, Gannon University, Erie, PA, 31 March - 1 April 1981.

Chairman, Miami International Symposium on Metal-Hydrogen Systems, Miami Beach, FL, 13-15 April 1981.

Advisor to Institut Superior des Materiaux et de la Construction Mecanique (France), Cooperating with the Agency for Energy Conference, May 1981.

Chairman, Organizing Committee, Seminar on Alternative Energy Sources with Emphasis on Solar Energy, Miami, FL, 4-9 May 1981.

Invited Lectures, "The Unifier of Non-Conventional Energy Sources: Hydrogen Energy System," and "Unusual Applications of Hydrogen," Second International Symposium on Non-Conventional Energy, Trieste, Italy, 14 July - 6 August 1981.

Invited Lecture, "Conservation Through Hydrogen Energy," Second National Forum on Energy Conservation in Industry, 23-26 September 1981, Medellin, Columbia.

Invited Lecture, "Hydrogen Energy System and the Development of Amazonia," Conference on Energy for the Development of Amazonia, Leticia, Columbia, 1981.

Invited Lecture, "Solar/Hydrogen Energy System and Applications for Environmental Planning," Workshop on Alternative Technologies, Miami Beach, FL, 9 November 1981.

Invited Lectures, "Solar Energy and Hydrogen Energy," sponsored by the National Science Foundation, the Pakistan Science Foundation and the Indian National Remote Sensing Agency, at research organizations and universities in Karachi, Islamabad, and Lahore, Pakistan; and in Delhi, Hyderabad, Bombay and Ahmedabad, India, 12-24 February 1982.

Invited Lecture, "Applications of Hydrogen for Air Transportation," under the auspices of UNESCO, School of Aeronautical Engineering, Cordoba, Argentina; also "Hydrogen Energy System," Society of Engineers and Architects in Cordoba, 28 March - 7 April 1982.

Chairman, Organizing Committee, 16th Southeastern Seminar on Thermal Sciences, Miami Beach, FL, 19 - 21 April 1982.

Member, Organizing Committee, Fourth World Hydrogen Energy Conference, Pasadena, CA, 13-17 June 1982.

Keynote Address, "Hydrogen System: A Smooth Phase-In," World Hydrogen Energy Conference IV, Pasadena, CA, 13-17 June 1982.

Member, Systems Analysis Technical Committee, American Society of Mechanical Engineers.

Member, Seminar Program Committee, Gannon University College of Science and Engineering, 1981 and 1982.

Institutional Representative: Energy Research Council, University of Notre Dame, Notre Dame, IN, 1982.

United Nations Energy Consultant to Argentina: Scheduled visit, March, April 1982.

Organizer of a Hydrogen Energy Seminar for Peking and Shanghai, China, 1982.

Invited Lecture, "Hydrogen Energy System," Friends of Physics, Main Campus, University of Miami, Coral Gables, FL, 3 May 1982.

Invited Lecture, "Recent Environmental Studies and the Hydrogen Energy System," Spring Symposium on Hydrogen Outlook in Canada of the Electrochemical Society in Montreal, Canada, 7 May 1982.

Chairman, Second Spanish Seminar on Alternative Energy Sources with Emphasis on Solar Energy and Delivery of Opening Address, Miami, FL, 10 May 1982.

Member, International Advisory Committee for the Argentinean Energy Symposium, to be held in Bogota, Colombia, 13-30 July 1982.

Invited Lecture, "Hydrogen Energy System and Recent Progress," Third International Symposium on Non-Conventional Energy, Bogota, Colombia, 26 July 1982.

Lecture Tour in USSR, "Hydrogen Energy System and Hydrogen Production Methods," Moscow, Dushanbe, Samarkand, Bukhara and Tashkent, 21-29 August 1982.

Invited Lecture, "Hydrogen as an Alternative to Hydrocarbon Fuels," Broward County, American Society of Mechanical Engineering, 23 September 1982.

Invited Lecture, "Hydrogen Energy System: Available Replacement for Fossil Fuel System," South Florida American Institute of Chemical Engineers, Miami Lakes, FL, 9 December 1982.

Chairman, Organizing Committee, Fifth Miami International Seminar on Alternative Energy Sources, Miami Beach, FL, 13-15 December 1982.

Invited Lecture, "Quality of Life and its Components: Population, Energy, Pollution and Conservation," International Symposium on Energy and Conservation Measures, Kuwait, 5-9 February 1983.

Chairman, Organizing Committee, International Symposium-Workshop on Renewable Energy Sources, Lahore, Pakistan, 18-23 March 1983.

Chairman, Organizing Committee, Third Multi-Phase Flow and Heat Transfer Symposium-Workshop, Miami Beach, FL, 18-20 April 1983.

Invited Lecture, "Hydrogen Energy System and Comparison with Fossil Fuels," Conference on Non-Conventional Energy Sources, presented by Escuela Superior Tecnica, Buenos Aires, Argentina, 12-16 June 1983.

Invited Lecture and Keynote Address, "Hydrogen Energy Developments in the United States," 10th Anniversary Symposium of the Hydrogen Energy System Society of Japan, Tokyo, Japan, 5-7 September 1983.

Invited Lecture, "Hydrogen Energy System and Comparison with Fossil Fuels System," Texas A & M University, College Station, TX, 28 October 1983.

Chairman, Organizing Committee, Miami International Symposium on the Biosphere, Miami Beach, FL, 23-25 April 1984.

Invited Lecture and Opening Address, "Two-Phase Flow Instabilities in Single Channels," China-US Seminar on Two-Phase Flow and Heat Transfer, Xian, China, 8-15 May 1984.

Invited Lecture, "The Hydrogen Energy Economy," Monash University, Melbourne, Australia, 21 June 1984.

Member, Organizing Committee, Honorary Chairman and Opening Address, "The Hydrogen Energy System: The Next Action," Fifth World Hydrogen Energy Conference, Toronto, Canada, 15-19 July 1984.

Invited Lecture, "Hydrogen Energy System and Comparison with the Fossil Fuel System," Rotary Club of Homestead, Homestead, FL, 29 August 1984.

Symposium Co-Chairperson, U. S. - India Symposium-Workshop on Remote Sensing, Ahmedabad, India, 11-15 March 1985.

Member, Advisory Committee, Hydrogen in Metals International Symposium, Belfast, Northern Ireland, 26-29 March 1985.

Invited Lectures, "Hydrogen Energy System," and "Solar Production of Hydrogen," King Abdulaziz University, Jeddah, Saudi Arabia, 7-9 April 1985.

Symposium Co-Chairman, Chairman, Final Plenary Session on Hydrogen Energy for China and Invited Lecturer, "Hydrogen Systems and International Cooperation," and "Hydrogen Energy and its Environmental Effects," Beijing International Symposium on Hydrogen Systems, Beijing, China, 7-11 May 1985.

Invited Lecturer, "Hydrogen Energy System and Solar Production of Hydrogen," and "Hydrogen Versus Synthetic Hydrocarbon Fuels," at the invitation of the Soviet Academy of Sciences; lectures at Tblisi and Baku, Georgian SSR and Azerbaijan SSR, 22 June - 2 July 1985.

Member, Advisory Committee: Workshop on the Physics of Non-Conventional Energy Sources and Material Science for Energy, Trieste, Italy, 2-20 September 1985.

Invited Lecture, "Hydrogen Energy System and Implementation in Sun-Belt," Muslim Conference on Energy, Tunis, Tunisia, 15-18 September 1985.

Member, Organizing Committee, Energy for the Americas International Conference, San Juan, PR, 13-29 October 1985.

Invited Lecture, "Hydrogen Energy System vs. Fossil Fuel System," Energy for the Americas International Conference, San Juan, PR, 12-19 October 1985.

Chairperson, Seventh Miami International Conference on Alternative Energy Sources, Miami Beach, FL, 9-11 December 1985.

Invited Testimony in favor of the proposed bill, Hydrogen Energy Research and Development Act H. R. 3889, Committee on Science and Technology of the U.S. House of Representatives in Washington, DC, 12 March 1986.

Forum participant at the invitation of Governor Bob Graham, Growth Management and Florida Energy Forum, Miami, Florida, 14-15 March 1986.

Invited Lecture, "Hydrogen Versus Fossil Fuels," 8th Annual Seminar, Gannon University, Erie, PA, 18-19 March 1986.

Invited Lecture, "The Environmental and Health Costs of Hydrocarbons Compared with Hydrogen as an Energy Form," also presented as a proposal for a joint US-Canada project for converting the Midwest and Northeast.

United States and Eastern Canada to the Hydrogen Energy System, The Miami Beach Executives Club, Miami Beach, FL, 11 April 1986.

Invited Lecturer, "Hydrogen Energy System and Comparison with the Fossil Fuel System," The Miami Beach Executives Club, Miami Beach, FL, 11 April 1986.

Member, International Conference Committee, International Conference on Hydrogen and Methane in Africa, Brazzaville, R. P. Congo, 15 May 1986.

Symposium Chairman, U.S.-Spain Symposium on Renewable Energy Sources, Madrid, Spain, 18-23 May 1983.

Keynote Address and Invited Lecture, "Hydrogen Energy Economics," Symposium Chairman, U.S.-Spain Symposium on Renewable Energy Sources, Madrid, Spain, 18-23 May 1986.

Invited Lecture, "Hydrogen as the Clean Energy Fuel of the Future," Association of Energy Engineers, Miami, FL, May 1986.

Invited Lecture, "Progress and Problems in Hydrogen Technology re Energy Needs of Human Settlements," U. N. Expert Group Meeting on Energy in Human Settlements, Bangalore, India, 2-5 June 1986.

Keynote Address, "Dawning of the Hydrogen Era," Sixth World Hydrogen Energy Conference, Vienna, Austria, 20-25 July 1986.

Honorary Conference Chairman, Sixth World Hydrogen Energy Conference, Vienna, Austria, 20-25 July 1986.

Assistant to Project "Nuclear Engineering," and Special Task "Two-Phase Flow and Heat Transfer," for Centro Atomico Bariloche, Bariloche, Argentina, 21 July 1986.

Invited Lecture, "Future World Energy System Based on Hydrogen," Fourth Scientific Conference, Scientific Research Council, Baghdad, Iraq, 23-28 October 1986.

Invited Lecture, "The Relationship Between Scientific and Economic Progress and Energy Consumption and Education," also took part in the roundtable discussions of the Final Plenary Session of the Science and Technology in the Year 2000 Conference, Istanbul, Turkey, 4-6 November 1986.

Invited Lecture, "Hydrogen Energy System: Energy Infrastructure of the Future," Florida Chapter, Association of Energy Engineers, Miami, FL, 12 November 1986.

Chairman, Organizing Committee, Fourth Miami International Symposium on Multi-Phase Transport and Particulate Phenomena, December 1986.

Invited Lecture, "Status of Hydrogen Energy Research," USSR Academy of Sciences, Moscow, USSR, January 1987.

Invited Lecture, "Hydrogen Energy," Florida Atlantic University, Miami, FL, February 1987.

Series of Lectures, "Two Phase Flow Instabilities in Boiling Water Reactors" and "Hydrogen Production Using Nuclear Energy," Argentinean Atomic Energy Research Center, Bariloche, Argentina, under the auspices of the International Atomic Energy Agency; also discussed joint projects on Nuclear Reactor Instabilities and Hydrogen-Hydride Systems, March 1987.

Organizing Committee, Workshop on Materials Sciences, Energy and Development, Kingston, Jamaica, 23 March - 10 April 1987.

Invited Lecture, "Hydrogen Energy System and Comparison with the Fossil Fuel System," U. S.-Jamaica Workshop, University of the West Indies, Kingston, Jamaica, March 1987.

Invited Lecture, "Hydrogen vs. Synthetic Fossil Fuels," RETSIE Conferences, Los Angeles, CA, May 1987.

Invited Lecture, "Hydrogen Energy System vs. Fossil Fuels," Manila, Philippines, May 1987.

Co-Chairman, International Symposium-Workshop on Silicon Technology, Islamabad, Pakistan, June 1987; also gave the Opening Address and an Invited Lecture entitled "Hydrogen for Storing Solar Energy and Applications."

Participant, Third Session, Provisional World Parliament, proposed the Hydrogen Energy System, which was adopted as the future energy infrastructure of the world, Miami Beach, FL, June 1987.

Member, Program Committee, Second World Basque Congress, Bilboa, Spain, 18-23 October 1987; Invited Lecture, "Hydrogen Energy System: Energy Infrastructure of the Future."

Organizing Committee, Eighth Miami International Conference on Alternative Energy Sources, Miami, FL, December 1987.

Invited Lecture, "Economics of Hydrogen vs. Fossil Fuels," Hydrogen Photovoltaic Production Workshop, Honolulu, HI, January 1988.

Testimony before the Senate Committee, Washington, DC, regarding solutions to the Greenhouse Effect, June 1988.

Invited Lecture, "Hydrogen Energy System and the Comparison with the Fossil Fuels System," Annual Meeting of the Chemical Society, Toronto, Ontario, Canada, June 1988.

Invited Lectures, "Hydrogen as a Storage for Solar Energy," and "Comparison of Hydrogen with Fossil Fuels," NATO Institute on Energy, Izmir, Turkey, July 1988.

Visited the TUBITAK Research Center, Istanbul, Turkey, to give advice on energy research projects, August 1988.

Co-Chairman, International Symposium on Heat Transfer Enhancement and Energy Conservation, Guangzhou, China, 2-5 August 1988.

Honorary Chairman, Seventh World Hydrogen Energy Conference, Moscow, USSR, September 1988.

Keynote Address, "Takeoff of the Hydrogen Energy System," Seventh World Hydrogen Energy Conference, Moscow, USSR, September 1988.

Presentation, "Solar-Hydrogen Energy System for Libya," Seventh World Hydrogen Energy Conference, Moscow, USSR, September 1988.

Presentation, "Mixture Formation Techniques for Hydrogen-Fueled Internal Combustion Engines," Seventh World Hydrogen Energy Conference, Moscow, USSR, September 1988.

Invited Lecture, South Miami Rotary Club on "Hydrogen Energy," November 1988.

Invited Lecture, "Hydrogen Energy System as a Future World Energy System," Symposium on Frontiers of Physics, Lubbock, TX, 4-5 November 1988.

Invited Lecture, "The Hydrogen Energy System as an Answer to the Problems of the Greenhouse Effect, Acid Rains and Pollution," Global Energy Forum, ENERGEX '88, 25-30 November 1988, Tripoli, Libya; also met with and discussed energy problems and solutions with the Program Directors at the Solar Energy and Wind Energy Divisions of the Ministry of Energy.

Chairperson, Fifth Miami International Symposium on Multi-Phase Transport and Particulate Phenomena, Miami Beach, FL, 12-14 December 1988.

Chairman, International Organizing Committee, Manila International Symposium on the Development and Management of Energy Resources, Manila, Philippines, 26-28 January 1989.

Invited Lecture, "Hydrogen Energy System and Comparison with the Fossil Fuel System," Opening/Plenary Session, Manila International Symposium on the Development and Management of Energy Resources, Manila, Philippines, 26-28 January 1989.

Invited Lecture, "Hydrogen Energy System as an Answer to the Greenhouse Problem," Pacific International Center Workshop, Honolulu, HI, March 1989.

Participated in the Inauguration of the Turkish National Foundation for Science and Technology and took part in future planning activities, Istanbul, Turkey, 26 March 1989.

Invited Lecture, "Solar Hydrogen Versus Synthetic Fossil Fuels," Annual Meeting of the American Society of Chemical Engineers, Toronto, Canada, June 1989.

Invited Lecture, "Hydrogen Energy System as the Future System for the World," Zurich, Switzerland, 4 August 1989.

Invited Lecture, "Economic Comparison of Solar Hydrogen Energy with the Fossil Fuel System," International Symposium on Solar Hydrogen Energy for the Prevention of a Fossil Holocaust, Zurich, Switzerland; also took part in Panel Discussion for consideration of the implementation of a solar-hydrogen energy system for Europe, 1-2 November 1989.

Invited Lecture, "Cost of Energy for the Consumer Today and Tomorrow," Fourth Annual Conference on Environment and Renewable Energy, Basel, Switzerland, 1 December 1989.

Chairman, Organizing Committee, Ninth Miami International Congress on Energy and Environment, Miami Beach, FL 11-13 December 1989.

Invited Lecture, "Higher Education Reforms for Scientific and Economic Progress," Role of Science Technology in Progress Conference, Istanbul, Turkey, 16-20 April 1990.

Invited Lecture, "Importance of International Standards for Establishing the Hydrogen Energy System," Hydrogen Energy Technology Standards Conference, London, England, 17-23 June 1990.

Honorary Chairman, Eighth World Hydrogen Energy Conference, Honolulu, HI, 22-27 July 1990; Member, Organizing Committee.

Invited Lecture, "Past, Present and Future of the Hydrogen Economy," WHEC TREK: The Next Generation, Honolulu, HI, 26 July 1990.

Invited Lecture, "Economics of Hydrogen," Eighth World Hydrogen Energy Conference, Honolulu, HI, 22-27 July 1990.

Invited Lectures, Symposium on Energy for Isolated Settlements, Buenos Aires, Argentina, "Hydrogen as an Energy Vector," 6 August; "Hydrogen Production Methods," 7 August, and "Viability of Hydrogen Utilization in Isolated Settlements," on 8 August 1990.

Invited Lectures on Hydrogen Energy, Alternative Energy Sources, Greenhouse Effect and Environmental Problems and Energy, various universities in Turkey, TUBITAK Research Center and the Turkish Foundation for Scientific and Technological Research, 11-25 August 1990.

Convener, Geothermal and Other Forms of Renewables Session, World Renewable Energy Congress, Reading, United Kingdom, 23-28 September 1990.

Chairman, Organizing Committee, Sixth Miami International Symposium on Multiphase Transport and Particulate Phenomena, Miami Beach, FL, 10-12 December 1990.

Member, Organizing Committee, RNAAS Colloquium on "Emerging Energy Technologies for a Sustainable Future," Amsterdam, The Netherlands, 4-8 March 1991.

Invited Lecture, "Misdeeds of the Fossil Fuels and a Permanent Solution: The Hydrogen Energy System," USSR Academy of Sciences, Baku, USSR, 9-16 March 1991.

Invited Lecture, "Hydrogen as a Clean and Efficient Transportation Fuel," Developing Sound Energy Options for Florida's Future Meeting, Coral Gables, FL, 23 March 1991.

Invited Lecture, "The Permanent Energy System for the Sunshine State: The Solar Hydrogen Energy System," Coral Gables Kiwanis Club, Coral Gables, FL, May 1991.

Member, Executive Committee, International Conference on the Analysis of Thermal and Energy Systems, Athens, Greece, 3-6 June 1991.

Keynote Lecture, "Misdeeds of Fossil Fuels and a Permanent Solution," First International Symposium on Environmental Pollution and Control, Izmir, Turkey, 8 June 1991.

Keynote Lecture, "Comparison of the Solar-Hydrogen Energy System with the Fossil Fuel System," ACHEMA '91 International Meeting on Chemical Engineering and Biotechnology, Frankfurt, Germany, 9-15 June 1991.

Invited Lecture, "The Hydrogen World," Conference on Hydrogen Opportunities for Alaska, Anchorage, AK, 25 June 1991.

Invited Lectures, "Assessment of the Environmental Damage by Fossil Fuels" and "Economic Comparison of Hydrogen Energy and Fossil Fuel Systems," NATO ASI Meeting on Chemistry and Chemical Engineering of Catalytic Solid Fuel Conversion for the Production of Clean Synthetic Fuels, Akcay, Turkey, 21 July - 3 August 1991.

Member, Organizing Committee, Keynote Lecture, "Renewable Energy Sources for a Bright Future," First Baku International Symposium on Energy, Environment and Economy, Baku, Azerbaijan, USSR, 20-23 August 1991.

Organizing Committee, Keynote Lecture, "Conference Goals and Challenges," Project Hydrogen '91, Independence, MO, 16-18 September 1991.

Member, Organizing Committee, Hydrogen as a Renewable Energy Source for the Protection of the Environment - International Conference, Milan, Italy, 21 -23 October 1991.

Invited Lecturer, Colloquium on Energy Technologies and Sustainable Development: Long Range R & D Opportunities, Noordwijkerhout, The Netherlands, 4-7 December 1991.

Member, International Liaison Committee for International Conference and Exhibition on Advances in Materials and Processes, Bombay, India, 16-19 February 1992.

Invited Lecture, "New Turkish World and Economic Development," Annual Meeting of the Association of Turkish-American Scientists, 14 February 1992.

Invited Lecture, "The Hydrogen Energy System," Global Environmental Issues Class GSC 578, University of Miami, Coral Gables, FL, 3 March 1992.

Invited Lecture, "Environmental Problems Facing our Planet and the Permanent Solution by Replacing the Fossil Fuel System with the Hydrogen Energy System," Indian Institute of Technology, Bombay, India, 12 March 1992.

Honorary Chairman, Ninth World Hydrogen Energy Conference, Paris, France, 22-25 June 1992.

Member, Scientific International Committee, FLOWERS '92 Symposium, Florence, Italy, June 1992.

Co-Chairperson, Invited Lecture, "Pilot Projects: A Way Toward Initiation of the Hydrogen Energy System," First Tatarstan Symposium on Energy, Environment & Economics, Kazan, Tatarstan, Russia, 9-13 August 1992.

Invited Lecture, "Hydrogen Energy System and its Effective Cost," Second World Renewable Energy Congress, Reading, United Kingdom, 13-18 September 1992.

Member, International Steering Committee and Invited Lecture, Second World Renewable Energy Congress, Reading, United Kingdom, 13-18 September 1992.

Invited Lecture, "Hydrogen: The Universal Fuel and Comparison with Other Fuels," Workshop on the Resource Potential of Energy Gases, Palo Alto, CA, 20-23 October 1992.

Invited Lecture, "Hydrogen Energy System as a Solution to Global Environmental Problems," EXPO-92 for A Better World, Miami, FL, 20-22 November 1992.

Invited Lecture, Expert Group Meeting as an Energy Alternative for Developing Countries, Havana, Cuba, 16-18 December 1992.

Invited Lectures, "Environmental Problems Facing our Planet and Cost of Environmental Damage," and "Solar Hydrogen Energy System and Comparison with Fossil Fuel System," Second International Symposium-Workshop on Silicon Technology: Developments and Its Role in the Sun Belt Countries, Islamabad, Pakistan, 7-10 May 1993.

Session Chair, Project Energy '93, Kansas City, MO, 20-23 June 1993.

Invited Lecture, First International Conference on New Energy Systems and Conversions, Yokohama, Japan, 27-30 June 1993.

Invited Lecture, Baku International Symposium on Energy Environment and Economics, Baku, Azerbaijan, 17-20 August 1993.

Honorary Chairman, The Third Interrepublic Conference "Hydrogen Materials Science and Chemistry of Metal Hydridesm" Katsivelli, Ukraine, August-September 1993.

Invited Lecture, First National Symposium on Clean Energy, Istanbul, Turkey, 20-22 December 1993.

Honorary Chairman, "Twenty Years of the Hydrogen Movement: 1974-1994," Tenth World Hydrogen Energy Conference, Cocoa Beach, FL, 20-24 June 1994.

Invited Lecture, "Solar Hydrogen Energy System for Libya," Center for solar energy Studies, Tripoli, Libya, 25-30 July 1994.

Invited Lectures, "Environmental and Economic Reasons for Hydrogen Energy System," "Comparison of Hydrogen Energy System with Fossil Fuel System," and "Twenty Years (1974-1994) of Progress in Hydrogen Energy," NATO Advanced Study Institute on Hydrogen Energy Systems, Utilization of Hydrogen and Future Aspects, Akcay, Turkey, 21 August-3 Sept. 1994.

Invited Lecture, "Solar Hydrogen Energy system: Permanent Energy Option for Saudi Arabia," at the Second Saudi Symposium on Energy, Utilization and Conservation, Dahran, Saudi Arabia, 27-3 November 1994.

Invited Lecture, "Hydrogen Technologies," Fifth International Conference on Productivity and Quality Research (ICPQR '95), Miami, FL, 21-24 February 1995.

Keynote Address, "Progress in Hydrogen Energy and Recommendations to Canada," Seventh Canadian Hydrogen Workshop, Quebec City, Canada, 4-6 June 1995.

Keynote Address, "Advances in Hydrogen Energy Technologies," International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12-15 June 1995.

Invited Lecture, Hydrogen Power, Thermal and Electrochemical Systems International Symposium (HYPOTHESIS), Cassino-Gaeta, Italy, 26-30 June 1995.

Invited Lecture, Workshop on Second Low Analysis of Energy System, Rome, Italy, 5-7 July 1995.

Member, Scientific Committee, Efficiency, Costs, Optimization, Simulation, and Environmental Impact of Energy Systems (ECOS '95), Istanbul, Turkey, 11-14 July 1995.

Invited Lecture, "Progress in Hydrogen Energy," Second International Conference on New Energy Systems and Conversions, Istanbul, Turkey, 31 July - 4 August 1995.

Member, Scientific Committee, Tenth National Heat Transfer Conference, Ankara, Turkey, 6-8 September 1995.

Invited Lecture, "Hydrogen Energy System as a Solution to Global Environmental Problems," Joint Fall Meeting of Texas Sections of American Physical Society and American Association of Physics Teachers & Society of Physics Students, Zone 13, Lubbock, Texas, 26-28 October 1995.

Co-Chairman, International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia; gave talk entitled "Energy and Environmental Considerations for a Sustainable Development". Took part in Public Round Table Discussion on Energy, Environment & Economics. Presented two papers entitled, "A Solution to Global Energy and Environmental Problems: Hydrogen Energy System" and "Progress in Hydrogen Energy System", 20-24 November 1995.

Lecture, "Environmentally Compatible System: Hydrogen Energy System", Indian National Environmental Engineering Research Institute in Nagpur, India, 11 December 1995.

Invited Lecture, "Hydrogen Energy for a Sustainable Future," Expert Group Meeting, International Centre for Hydrogen Energy Technologies, Istanbul, Turkey, 27-29 May 1996.

Invited Lecture, "Developments in Hydrogen Energy Technologies," Expert Group Meeting, International Centre for Hydrogen Energy Technologies, Istanbul, Turkey, 27-29 May 1996.

Honorary Chairman, 11th World Hydrogen Energy Conference, Stuttgart, Germany, 23-27 June 1996.

Opening Address, "Hydrogen Energy System: Fossil Fuel Industry and Sustainability Economics," 11th World Hydrogen Energy Conference, Stuttgart, Germany, 23-27 June 1996.

Invited Lecture, "Hydrogen Energy for a Sustainable Future," National University of Spain, Madrid, Spain, 15-19 July 1996.

Opening Keynote Address and two Plenary Lectures entitled "Interconnected Global Problems of Energy & Environment and Solutions," "Comparison of Hydrogen Energy and Fossil Fuels," and "Hydrogen Energy System and its Environmental Benefits," First Trabzon International Energy & Environment Symposium, organized by Karadeniz Technical University, 29 July - 26 August 1996.

Seminar entitled "Hydrogen Energy as an Answer to Global Energy and Environmental Problems," Mugla University, Turkey, 29 July – 26 August 1996.

Theme Address at Opening Session, and lecture entitled "Progress in Hydrogen Energy and Recommendations for Early Implementation," at the Workshop on Hydrogen Energy Technologies, Banaras Hindu University, Varanasi, India, 29 November – 1 December 1996.

Panelist, U.S. Department of Energy Hydrogen Technical Advisory Panel, Alexandria, Virginia. Gave presentation entitled "Hydrogen Energy Activities Abroad and Recommendations to the Department of Energy," 10-11 March 1997.

Invited Lecturer, Inaugural Meeting of the Argentinean Hydrogen Energy Association; Opening Lecture entitled "Hydrogen Energy System as a Solution to Global Environmental Problems," 25-27 November 1997.

Two Lectures in Turkey: Electric Power Research Institute in Ankara, entitled "Hydrogen Energy: The Energy System of the 21st Century," and at the University of Nigde, "On Energy and Economic Progress", on 16 December 1997 and 18 December 1997 respectively.

Luncheon Speaker: Environmental Essential Workshop, organized by the Miami-Dade County Department of Environmental Resources Management. His talk was entitled "The Effect of Global Warming on South Florida and the Remedies", 8 April 1998.

Keynote Speaker, Seventh International Conference on Productivity and Quality Research, Miami, Florida. Lecture was entitled "Hydrogen Energy Factors in Environmental Quality and Sustainability Economics", 26-29 April 1998.

Invited Lecturer – NSF Novel Trends in Environmental and Agricultural Biotechnology, Izmir, Turkey. Two lectures: "Environmental Damage Caused by Fossil Fuels," and "Remediation of the Environmental Damage caused by Fossil Fuels through the Solar Hydrogen Energy System," 11-14 May 1998.

Honorary Chairman, 12<sup>th</sup> World Hydrogen Energy Conference, Buenos Aires, Argentina. Opening Address entitled "Dawning of the Hydrogen Age"; also participated with three joint papers, participated at the Hydrogen Technical Advisory Panel deliberations, 21-25 June 1998.

Invited Lecture, ENERGEX '98 Conference, Manama, Bahrain. Keynote Address entitled "Solar Hydrogen Energy System: A Permanent Answer to Global Energy and Environmental Problems;" chaired the session on New Energy Options, and served on the Best Papers Selection Committee, 18-21 November 1998.

Participant at the Third Workshop on Energy and Environment, Tripoli, Libya, . 20-21 October 1998.

Invited Lecture, Mackenzie University, Sao Paulo, Brazil. Gave three lectures on Solar Hydrogen Energy System as the Permanent Answer to Global Energy and Environmental Problems, 26-29 November 1998.

Honorary Member: University of Miami Heritage Society – 1999.

Invited Lecture: 8<sup>th</sup> International Conference on Productivity and Management of Technology, Cairo, Egypt, 16-18 March 1999,. The title of the lecture was: "Hydrogen Factor for Achieving a Sustainable Future". He also made a presentation to the scientists at the Egyptian National Research Center in Dokki, Cairo, entitled "Solar Hydrogen Energy System for Economic Development of Egypt".

Co-Chairman of The First Minia International Conference for Advanced Trends in Engineering, Minia, Egypt, 14-16 March 1999, Minia, Egypt. His Opening Lecture was entitled "Solar Hydrogen Energy System: A Permanent Answer to Energy and Environmental Problems". He also served on the Advisory Board of the Governor of Minia for the new Industrial Zone being established.

Invited Lecture: "Externalities Associated with Burning Fossil Fuels," 10<sup>th</sup> Annual U.S. Hydrogen Meeting: Hydrogen: Setting the Standard for a Global Energy System, Tyson's Corner, Vienna, Virginia, 7-9 April 1999.

Invited Lecture, "Clean Energy, Clean Environment and Competitiveness," 8<sup>th</sup> International Conference on Productivity and Quality Research, Vaasa, Finland, 14-16 June 1999.

Keynote Lecture: "Achieving a Sustainable Future," 4<sup>th</sup> International Conference on new Energy Systems and Conversions, Osaka, Japan, 27- June – 1 July, 1999.

Invited Lecture entitled "Clean Energy and New Energy Systems," 4<sup>th</sup> International Conference on New Energy Systems and Conversions, 27 June-1 July 1999, Osaka, Japan.

Invited Lectures, National University of Spain, "Solar Hydrogen Energy System and its Implications for Spain to the participants of the NUS Extension Course in Avila; also "Achieving Sustainability and the Role of Hydrogen Energy" to the Engineering Faculty of the University of Seville, Spain, as well as a television interview concerning Hydrogen Energy as a Solution for Global Warming on the National Education Television in Madrid, 18-23 July 1999.

Co-Director, International Organizing Committee of the ICHMS'99 Conference in Katsiveli, Crimea, Ukraine, 2-8 September 1999.

Keynote Address entitled "Achieving Sustainable Future," 5<sup>th</sup> Baku International Congress on Energy Ecology Economy, Baku Azerbaijan; also testified before the Azerbaijan Parliamentary Committee on Ecology on the Protection of the Environment, 21-24 September 1999.

Keynote Address entitled "Hydrogen Energy as a Solution to Global Energy and Environmental Problems," First International Energy Conference in Al-Ain, United Arab Emirates, 7-9 May 2000.

Seminar entitled "Renewable Energy: the Solar Hydrogen Energy System" at the United Arab Emirates University in Al-Ain, United Arab Emirates, May 2000.

Invited Lecture: NATO-ASI, Izmir, Turkey, June 2000.

Opening Address entitled "Implementation of the Hydrogen Economy," Also Keynote Address entitled "Quarter Century of the Hydrogen Movement," 13<sup>th</sup> World Hydrogen Energy Conference, Beijing, China, 11-15 June 2000.

Opening Address entitled "Hydrogen Energy and the Importance of Safety; also Keynote Address entitled "Safest and Environmentally Most Compatible Energy System – Hydrogen Energy System," First International Symposium on Safety and Economics of Hydrogen Transport, Sarov, Russia, 24-28 July 2000.

Presentations entitled "Hydrogen Energy System for Mitigating Global Warming," Pakistan National Workshop on Kyoto Protocol Implementation, and a presentation entitled "Hydrogen Energy System: Permanent Solution to Global Energy and Environmental Problems, at the Pakistan Council of Science and Technology, Islamabad, Pakistan, 29 July through 1 August 2000.

Invited Lecture, "Hydrogen Production, Storage, Distribution and Utilization Technologies" at the North Rhine Westphalia Energy Industry Symposium, Düsseldorf, Germany, 15 September 2000.

Honorary Chairman, Welcoming Address and talk entitled "Hydrogen Energy as a Solution to Global, Energy and Environmental Problems" to the YOUTH HYFORUM 2000, HYFORUM 2000 MEETING, Munich, Germany, 10-14 September 2000.

Invited Paper entitled "Hydrogen Energy System and Comparison with Fossil Fuel System; also Banquet Address entitled "Quarter Century of Hydrogen Movement," Forum on Converting to a Hydrogen Economy, Fort Collins, Colorado, 22-24 September 2000.

Invited Lecture entitled "Quarter Century of Hydrogen Movement," Hydrogen Energy Colloquium, Lyon, France, 17 October 2000.

Invited Lecture entitled "Hydrogen Energy and Transportation," International Conference on Automotive Technology 2000, Istanbul, Turkey, 19-20 October 2000.

Invited Presentation entitled "Converting Florida to a Solar Hydrogen Energy System from the Present Fossil Fuel System and luncheon speech entitled "Progress in Hydrogen Energy, at the Hydrogen Summit Meeting: Planning the Bridge to Florida's Future, Tallahassee, Florida, 24-25 October 2000.

Invited Lecture entitled "Hydrogen Energy and Transportation," First International Seminar on Fuel Cells for Transportation, Mexico City, Mexico, 7-8 November 2000.

Honorary Membership in the Argentina Academy of Science; lecture entitled "Hydrogen Energy: Permanent Solution to Global Energy and Environmental Problems, to the Argentina National

Hydrogen Association in Buenos Aires; lecture entitled "Hydrogen Energy System and Argentina" to the Argentina Academy of Science in Cordoba, 23-24 November 2000.

Invited Lecture entitled "Energy, Education and Economic Development" to the Turkish National Security Council, Ankara, Turkey, 29 November 2000.

Invited Lecture entitled "Hydrogen Energy System: A Permanent Solution to Global Energy and Environmental Problems" at the Gazi University, Ankara, Turkey, 30 November 2000.

Keynote Address entitled "Hydrogen Energy System: Permanent Solution to Global Energy and Environmental Problems," at the Second Congress of the Mexican Hydrogen Energy Society, Cuernavaca, Mexico, 7-8 December 2000.

Invited Lectures entitled "Hydrogen Energy System Concept and its Progress" and "Comparison of Hydrogen Energy System with Fossil Fuels," Workshop on New Trends and Breakthroughs in Hydrogen Energy, Istanbul, Turkey, 2-5 April 2001.

Keynote address entitled, "Hydrogen Energy System for Sustainability," at the Opening Session of the 3<sup>rd</sup> International Conference, "Hydrogen Treatment of Materials" (HTM-2001) on May 15, 2001, Donetsk, Ukraine.

Invited Lecture entitled, "Economic and Environmental Comparison of Hydrogen Energy System with Fossil Fuel System," at the University of Malaysia in Kuala Lumpur, Malaysia, 20 August 2001.

Invited Lectures entitled "Hydrogen Energy System: Enabler of Renewable Energy Resources," Pakistan Council of Renewable Energy Technologies, Islamabad, Pakistan, 18 August 2001; "Economic and Environmental Comparison of Hydrogen Energy System with Fossil Fuel System," University of Malaysia in Kuala Lumpur, Malaysia 20 August 2001; Keynote Address, "Hydrogen Energy and Quarter Century of Hydrogen Movement," 5<sup>th</sup> International Conference on New Energy Systems and Conversions, Shanghai, China, 22-25 August 2001.

Honorary chairman at the VII International Conference "Hydrogen Materials Science and Chemistry of Metal Hydrides, Alushta, Crimea, Ukraine, 17-21 September 2001; also gave Opening Speech "Importance of Hydrogen – Materials Reactions" and Keynote Address "Hydrogen Energy System and its Progress over Quarter of a Century".

Invited Lecture, "Hydrogen Energy System for Sustainability: Permanent Solution Global Energy Environmental Problems," Fifth International Conference on Ecomaterials, Honolulu, Hawaii, 2-4 October 2001.

Keynote Address, "21<sup>st</sup> Century's Energy: Hydrogen Energy System and Economy," Energy Forum, Istanbul, Turkey, 27-29 November 2001; also co-chaired Roundtable discussion on Energy.

Invited Lecture, "Hydrogen Energy System: Permanent Answer to Global Energy and Environmental Problems," University of Paris, Paris, France, 4-8 November 2001; also

participated in roundtable discussion with members of French Hydrogen Energy Association concerning possible joint projects.

Invited Panelist at "Panorama 2002: Which Fuels for tomorrow?" Meeting organized by the French Petroleum Institute, Paris, France, 6 February 2002; also gave a presentation entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System".

Invited Lecturer at the Euro Course on Hydrogen Energy and Sustainability, Lisbon, Portugal, 12-16 April 2002; gave four lectures: "Environmental Degradation," "Quantification of Global Environmental Damage," "Hydrogen Energy System: Permanent Solution to Global Energy-Environmental Problems" and "Achieving Sustainability and Sustainability Economics".

Panelist to the 3<sup>rd</sup> International Energy Summit, 16-18 April 2002, Hannover, Germany. Speaker at the Hydrogen Energy Session, and discussed "the Present State and Future Promise of Hydrogen Energy Technologies".

Two invited lectures at the 70<sup>th</sup> Anniversary Celebrations of the University of Putra, Malaysia, Selangor, Malaysia, 13-18 May 2002. Two lectures entitled "Hydrogen Energy Fundamentals", and "21st Century's Energy: Hydrogen Energy System".

Honorary Chairman and Keynote address speaker of the 14th World Hydrogen Energy Conference at Montreal, Canada, 9-13 June 2002, and gave a lecture at the University of Montreal. Opening Address entitled "Dawn of the Hydrogen Age" and lecture at the University of Montreal entitled "21st Century's Energy: Hydrogen Energy System".

Invited speaker for one of the major Hydrogen producers of the world, Praxair Inc, of Houston, Texas, 22-24 June 2002. Lecture entitled "21st Century's Energy: Hydrogen Energy System and Opportunities for Hydrogen Producers".

Invited lecturer at three meetings in Turkey. First: Hydrogen Energy Conference in Ankara, gave the Keynote Address entitled "21st Century's Energy: Hydrogen Energy System". Second: Sakarya University in Adapazari, entitled "Hydrogen Energy System: Permanent Answer to Global Energy-Environment Problems". Third: Military Academy, Istanbul, entitled "Hydrogen Energy and Economic Progress," 16-19 July 2002.

Invited speaker at the 8th International Symposium on Renewable Energy Education, 4-8 August 2002, Orlando, Florida. Lecture entitled "Education and the Hydrogen Energy System".

Invited guest of the University of Azores, Portugal, met with government and university officials to discuss conversion of the energy system in the Islands to Hydrogen Energy and lecturer at the Environmental Studies Center of the University, in Terceira Island, lecture entitled "Hydrogen Energy: The Most Environmentally Compatible Energy System", 22-26 September 2002.

Invited speaker at the General Electric Research Laboratories Seminar in Schenectady, New York, 25 October 2002. Lecture entitled "21st Century's Energy: Hydrogen Energy System".

Invited Speaker and Panelist at the Trans Atlantic Congress, "Reshaping Transatlantic Relations for the 21" Century: The Citizen's Perspective", Miami Beach, FL, 14-16 November 2002.

Lecture entitled "Hydrogen Energy System and Cooperation between Transatlantic Countries". During the panel "Environmental Challenges: Which Changes are European and American Societies Ready to Accept?" discussed.

Invited lecturer at the Hydrogen Energy to French and European Scientific Organizations (CNRS Headquarter Paris, lecture entitled "21" Century's Energy: Hydrogen Energy System" At Orleans laboratory of CNRS lecture entitled "Hydrogen Energy System and Research Opportunities in the Combustion and Materials Fields".

Lecturer at the European Space Agency (ESA) Headquarter in Paris lecture entitled "Hydrogen Energy and Opportunities for Space Scientists in its Implementation", and also discussed possible joint projects with the scientists at both CNRS and ESA organizations, 25-29 November 2002.

Invited Seminar Speaker at the Graduate School of the Fatih University, Istanbul. Two lectures entitled "21" Century's Energy: Hydrogen Energy System" and "Energy, Education and Economic Progress," 25 December 2002 - 2 January 2003.

Invited Speaker to the Department of Mechanical Engineering Seminar Series of the Florida International University, giving a talk entitled "21st Century's Energy: Hydrogen Energy System" on Wednesday, 22 January 2003.

Invited lecturer at the Hydrogen Energy Workshop, 10-14 March 2003, Kuala Lumpur, Malaysia, giving the Opening Address entitled "21st Century's Energy: Hydrogen Energy System," at the Opening Plenary Session of the Workshop. And on the 2nd day, giving a paper entitled "Establishing Hydrogen Energy System in Malaysia". On the 3<sup>rd</sup> day of the Workshop, he chaired the Workshop Report Committee and drafted the Workshop Report entitled "Planning the Introduction of the Hydrogen Economy in Malaysia". On Friday, 14 March, the Workshop Report was presented to the First Secretary of the Department of Energy.

Invited Lecturer to the Nanyang Technological University, Singapore, 15-18 March 2003. On Monday, 17 March, giving a talk entitled "Hydrogen Energy and its Advantages for Singapore," and discussing the possibilities of joint research projects between the Clean Energy Research Institute of the University of Miami and the Advanced Clean Energy Centre of the Nanyang Technological University.

Invited lecturer at the 2003 International Conference on Innovative Materials, 18-21 March 2003, Shanghai, China, giving the Keynote Address entitled "21st Century's Energy: Hydrogen Energy System". At the Opening Plenary Session, on Wednesday, 19 March 2003, Dr. Veziroglu gave a presentation entitled "Innovative Materials for Achieving the Hydrogen Economy".

Invited by Princeton University to make a presentation at their annual Mica Ertegun Conference, on Friday, 11 April 2003, entitled "Hydrogen Energy System: Permanent Solution to Global Energy and Environmental Problems, as well as another entitled "International Problems Caused by Petroleum".

Invited lecturer at the Hydrogen Economy Conference, 18-22 May 2003, Broome, Australia, which was the kick-off meeting for the initiation of a governmental effort for converting Australia to the Hydrogen Economy and was attended by the Ministers of Resources and Energy, Interior, and Tourism. At the Opening of the Conference, Dr. Veziroglu gave the Keynote Address entitled "21st Century's Energy: Hydrogen Energy System," and on the second day, he gave a talk entitled "Establishing Hydrogen Energy System in Australia". Dr Veziroglu also chaired a Panel Discussion on the Conversion of Australia from the Fossil Fuel System to the Hydrogen Economy. On the third day, Dr. Veziroglu was the guest of the Australian Minister for the Interior, who flew him over the Tidal Energy Basin in Northwest Broome, and discussed the utilization of tidal energy through hydrogen production.

Invited Lecturer at the National Energy Symposium, 23-25 May 2003. Denizli. Turkey, giving the Keynote Address entitled "Energy, Education and Economic Progress," and on the second day of the meeting, making a presentation entitled "Hydrogen Energy: A Permanent Solution to Global Energy-Environmental Problems". Dr. Veziroglu also chaired a panel discussion on the Transition from Fossil Fuels to the Hydrogen Economy.

Invited Lecturer of Turkish Scientific Organizations, 25-29 May 2003, Istanbul. Turkey, and talked to the Mechanical Engineering Society on "Energy, Education and Economic Progress". He also talked to the Science 1884 Foundation on "Hydrogen Energy: Permanent Answer to Global Energy and Environmental Problems" and to the Society of Chemical Engineers on "21<sup>st</sup> Century's Energy: Hydrogen Energy System".

Invited speaker for the Turkish Hydrogen Energy Week Celebrations 7-12 July 2003. On Tuesday, 8 July, he gave a public lecture at the Istanbul Hilton Conference Center entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System"; on Wednesday, 9 July, he gave the Opening Address entitled "Hydrogen Energy System: Permanent Answer to Global Environment-Energy Problems," at the Second National Hydrogen Energy Congress, at the Ankara Hilton Conference Center; On Friday, 11 July, he gave a Seminar on Hydrogen Energy Technologies at the Chamber of Industry in Izmit, Turkey.

Invited speaker at the XII International Materials Research Congress, 17-20 August 2003, Cancun, Mexico. At the Opening of the Congress, on Monday, 18 August, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and Special Material Requirements". He also participated in the Round Table discussion the last day of the Congress.

Invited speaker at the International Workshop on the Present Status of Hydrogen, 21-22 August 2003, Mexico City, Mexico. At the Opening Session of the Workshop, Dr. Veziroglu gave the Keynote Address entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System". In addition, Dr. Veziroglu was a panelist in the Roundtable Discussion on "Research and Development Opportunities in the Emerging Hydrogen Economy," on the second day, at the Final Session of the Workshop.

Invited Lecturer of the Turkish Universities and Professional Societies, 13-18 October 2003. On Tuesday, 14 October, he gave a lecture at the Sabanci University, Istanbul, entitled "Hydrogen

Energy System for Sustainability"; on Thursday, 16 October, he gave a lecture at the Society of Mechanical Engineers in Izmir, entitled "21st Century's Energy System"; and on Friday, 17 October, he lectured at the Celal Bayar University in Manisa, on "Permanent Solution to Global and Environmental Problems: Hydrogen Energy System".

Invited Speaker at the United Nations Meeting on Science and Technology for Sustainable Development, Wednesday, 5 November 2003, New York, N. Y. Dr. Veziroglu gave a talk entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System" and also participated in the ensuing panel discussion.

Invited Speaker at the Annual Meeting of the United Nations Industrial Development Organization (UNIDO) in Vienna, Austria, 1-5 December 2003. On Thursday, 4 December, he made a presentation entitled "Hydrogen Energy System to Boost the Economies of the Developing Countries".

Invited Speaker at the 4th National Energy Symposium, Ankara, Turkey, 10-11 December 2003. At the Opening of the Symposium, on Wednesday, 10 December, Dr. Veziroglu gave the Keynote Address entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System".

Invited Lecturer at the International Workshop on Hydrogen Energy, Delhi, India, 11-13 December 2003. At the Opening of the Workshop, on Thursday, 11 December, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System: Its Advantages to the Indian Economy". On the last day of the Workshop, December 13, Dr. Veziroglu participated in the Panel Discussion on Economic Issues Relating to the Hydrogen Energy System.

Invited Lecturer at the Annual Meeting of the Assembly of Turkish American Associations, Washington, D.C., 30-31 January 2004. Also gave the Keynote Address entitled "Energy, Education and Economic Progress".

Invited Lecturer at the United Nations Industrial Development Organization (UNIDO) Seminar on Small Hydro Power Cooperation among Developing Countries, 16-18 April 2004, Hangzhou, China. At the Opening of the Seminar, gave a special lecture entitled "Synergy between Hydrogen Energy and Small Hydro Power".

Invited Speaker at the 5<sup>th</sup> International Clean Energy Symposium, 26-28 May 2004, Istanbul, Turkey. At the Opening of the Symposium, on Wednesday 26 May, he gave the Keynote Address entitled "Hydrogen Economy: Clean and Abundant Energy". Dr. Veziroglu also participated at the Round Table discussion at the Closing Session of the Symposium on Friday, 28 May.

Invited Lecturer at the International Conference on Renewable Resources and Renewable Energy: A Global Challenge, 10-12 June 2004, Trieste, Italy. Dr. Veziroglu gave a talk entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System". Dr. Veziroglu also participated in the debate on Renewable Resources and Renewable Energy. Participated at the Fuel Cell Summit VII, 15-17 June 2004, University of Miami Convocation Center. Gave the Welcoming Address entitled "The Birth of the Hydrogen Economy at the University of Miami".

Participated at the 15<sup>th</sup> World Hydrogen Energy Conference, 27 June - 2 July 2004, Yokohama, Japan. At the opening of the Conference on Monday morning, 28 June, Dr. Veziroglu gave the Welcoming Address. In addition, Dr. Veziroglu had six joint papers at the conference, viz., "Hydrogen Civilization – a New Paradigm for the Humankind Life," "Experimental Studies of a Direct Methanol Fuel Cell," "Hydrogen from H<sub>2</sub>S in the Black Sea," "A Review of Hydrogen Storage Systems Based on Boron and its Compounds," "The Unique Rodriquez-Baker Data on Hydrogen Storage in Graphite Nanofibers Might be True," and "Internal Combustion Engines Fueled by Natural Gas-Hydrogen Mixtures".

Participant at the First Capadoccia Mechanical Engineering Symposium, 14-16 July, 2004, Cappadocia, Turkey. A talk entitled "Industrial revolution and Mechanical Engineering". Presentation entitled "Hydrogen Energy System and Mechanical Engineering Aspects". Two joint papers, viz. "On Micromechanisms of Hydrogen Plastification (Superplasticity) and Embrittlement (Degradation) of some Technologically Important Solids", and " On the Hydrogen On-Board Storage in Graphite Nano-fibers for Fuel Cell-Powered Non-Polluting Vehicles".

Invited speaker at the Annual Meeting of the Princess Islands Sea Club, Istanbul, Turkey, on Sunday, 15 August 2004. Dr. Veziroglu gave a talk entitled "Global Environmental Problems and their Permanent Solution: Hydrogen Economy". After the presentation, there was a Panel Discussion on "Environmental Problems Related to Oceans and their Solutions".

Invited speaker at two meetings, which took place in Sydney, Australia, viz., meeting of the International Steering Committee on Solar-Hydrogen, 22-25 August 2004, and the International Conference on Materials for Hydrogen Energy, 27 August 2004. At the first meeting Dr. Veziroglu presented two papers, i.e., "21<sup>st</sup> Century's Energy: Hydrogen Energy System" and "Establishing Hydrogen Energy System in Australia". At the second meeting, he gave a talk entitled "Materials for Hydrogen Energy Production, Storage and Utilization". Dr. Veziroglu also participated at the Round Table Discussion: Planning a road map for converting Australia to the Hydrogen Economy.

Invited Speaker at the International Climate Change Conference, 1-3 September 2004, Ankara, Turkey. Keynote Address entitled "Permanent Solution to Climate Change: Hydrogen Energy System". Participant in the debate on Solutions to Climate Change. Debate on Solutions to Climate Change.

Invited speaker at the UNIDO-CII Conference & Green Business Summit on Resource Sustainability & Closing Material Loops, 21-23 September 2004, Hyderabad, India. At the conference, he gave the following two talks, viz., "21<sup>st</sup> Century's Energy: Hydrogen Energy System" and "Achieving Sustainability through Sustainability Economics". After the conference, Dr. Veziroglu visited Delhi, India, at the invitation of the Ministry of Non-Conventional Energy Sources and discussed the Indian Road Map for Conversion to Hydrogen Economy.

Keynote Speaker at the Energy and World Symposium, 1 October 2004, Hilton Hotel, Istanbul, Turkey. At the opening of the Symposium, he gave the Keynote Address entitled "Forthcoming Hydrogen Civilization: Permanent Solution to Global Problems". Dr. Veziroglu also participated in the Discussion Session at the end of the Symposium.

Invitation to the Energy Seminar organized by the Turkish Asian Centre for Strategic Studies at Kadir Has University, Istanbul, Turkey, 26 October 2004. Dr. Veziroglu gave a lecture entitled "Hydrogen Civilization: Achieving Sustainable Future for Humankind".

Invited speaker at the Energy Symposium of the Istanbul Technical University, 4 November 2004. At the Seminar, Dr. Veziroglu gave a lecture entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System and Related Activities in Turkey". He also participated in the Discussion Session at the end of the Symposium.

Invited lecturer at the Naturel 2004 Meeting, 5-7 November 2004, Istanbul, Turkey. At the Energy Session on Saturday, 6 November 2004, Dr. Veziroglu gave a lecture entitled "Reaching a Healthy Environment through Hydrogen Energy System". At the end of the Session, Dr. Veziroglu participated in the Discussion Period.

Invited lecturer at the 7<sup>th</sup> International Symposium on Next Generation Vehicle Technology, organized by Chonnam National University, Gwangju City, South Korea, 10 December 2004. At the opening session, Dr. Veziroglu presented an invited lecture entitled "Hydrogen Energy and Fuel Cell Powered Vehicles". At the end of the Symposium, Dr. Veziroglu participated in the Panel Discussion on the Next Generation of Vehicle Technologies.

Invited speaker by the Turkish Association of the Chemical Engineers to their annual meeting on 18 December 2004, at Marmara University, Istanbul, Turkey. Dr. Veziroglu made a presentation entitled "Hydrogen Civilization: Solving Energy - Environmental Problems and Providing Humankind with Higher Quality of Life".

Invited speaker by the Turkish National Petroleum Company in Ankara, Turkey, on Tuesday, 21 December 2004. Dr. Veziroglu gave a presentation entitled "Hydrogen Energy System and Recommendations to Petroleum Companies", and took part in the ensuing Panel Discussion.

Invited speaker at the monthly meeting of the Science, Art and Philosophy Academy in Istanbul, Turkey, on Saturday, 8 January 2005. Dr. Veziroglu made a presentation entitled "The Importance of Science and Education for Economical Progress".

Invited speaker at the Faculty of Engineering Seminar of Hacettepe University, Ankara, Turkey, on Thursday, 13 January 2005. Dr. Veziroglu gave a talk entitled "Hydrogen Energy and R&D Needs".

Invited speaker and gave a talk entitled "Hydrogen Energy System: Permanent Solution to Global Energy and Environmental Problems" at the Miami Museum of Science on Tuesday, 18 January 2005. After the presentation, Dr. Veziroglu and the Museum of Science Board Members discussed the possibility of a permanent Hydrogen Energy exposition at the new Museum of Science location in downtown Miami.

Visited IIT Kharagpur, 22-26 January 2005, in connection with the bi-national research project on biological hydrogen production. On Tuesday, 25 January 2005, Dr. Veziroglu gave a lecture entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System" to the Faculty of Engineering at IIT Kharagpur.

Invited lecturer at the Banaras Hindu University, Varanasi, India, 26 through 27 January 2005. On Thursday, 27 January 2005, Dr. Veziroglu gave a lecture entitled "Hydrogen Energy System: Permanent Solution to Energy and Environmental Problems" to the Faculty of Science.

Invited speaker at the monthly Seminar of MHP Political Party, Ankara, Turkey, 3 February 2005. Dr. Veziroglu's talk was entitled "Hydrogen Energy System and Benefits for Turkey".

Invited lecturer by the Ministry of Energy of Libya, Tripoli, 12 through 14 February 2005. On Sunday morning, 13 February 2005, Dr. Veziroglu gave a talk entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System" at the National Bureau of Research & Development in Tripoli. The same evening, Dr. Veziroglu gave a talk entitled "Solar Hydrogen System for Libya" to the Society of Libyan Engineers.

Invited lecturer at the International Workshop on Business Opportunities for Clean Development, 16-18 February 2005, Istanbul, Turkey. On Friday morning, 18 February 2005, in the Session on New Fuels, Dr. Veziroglu gave a talk entitled "Environmentally Most Compatible Fuel: Hydrogen and Hydrogen Energy System".

Invited lecturer by the University of 7<sup>th</sup> October Misurata, Misurata, Libya. On Tuesday, 15 February 2005, at the monthly Seminar of the University, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System: Permanent Answer to Global Energy & Environmental Problems".

Invited lecturer by the Sustainable Environment Research Centre (SERC) of the University of Glamorgan, 20 through 23 February 2005. On Monday, 21 February 2005, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System as the Permanent Answer to Global Energy and Environmental Problems and the Business Opportunities". The meeting was attended by the Minister of Economy for Wales, Vice-Chancellor of the University of Glamorgan, and business leaders of Cardiff, as well as by the faculty and graduate students of the University of Glamorgan. Also, Dr. Veziroglu met with the members of the Sustainable Environment Research Centre (SERC) and discussed the possible avenues of research cooperation.

Invited lecturer by the Instituto Superior Técnico, Lisbon, Portugal, 27 February - 2 March 2005. On Tuesday, 1 March 2005, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System and its Implications for Transportation". Dr. Veziroglu also discussed possible avenues of cooperation with Prof. Rosario Macario of the Transportation Studies Centre of the University.

Invited speaker at the monthly seminar of Feza Gursey Institute of Physics, Istanbul, 17 March 2005. Dr. Veziroglu gave a talk entitled "Unusual Properties of Hydrogen Molecule and Hydrogen Economy".

Invited speaker on Tuesday, 15 March 2005, at the Sisli Rotary Club, Istanbul, Turkey. Dr. Veziroglu gave a lecture entitled "Rising Petroleum Prices and Prospects for Hydrogen Energy".

Invited speaker at the International Conference "Sustainability: The Future of the Business," 17-18 March 2005, Istanbul, Turkey. At the Plenary Session of the Conference, Dr. Veziroglu gave a talk entitled "Business Opportunities in Hydrogen Energy Field".

Invited speaker at the Turkish National Science Foundation Conference "Hydrogen Energy: Is it Real or is it a Dream?," 18 March 2005, Ankara, Turkey. Dr. Veziroglu gave a talk entitled "Hydrogen Energy: It is Real," and participated at the Panel Discussion at the end of the Conference.

Co-Chairman of the Hydrogen is the Future Workshop, 26 March 2005, Sabanci University, Istanbul, Turkey. At the Opening Plenary Session, Dr. Veziroglu welcomed the delegates to the Workshop and talked about the importance of Hydrogen Energy for the World Economy, as well as the Environment. Dr. Veziroglu also chaired the Panel Discussion at the end of the Workshop.

Invited speaker at the monthly Seminar of the International Technology, Economy & Social Research Foundation, Istanbul, Turkey, 31 March 2005. Dr. Veziroglu gave a talk entitled "Conversion to the Hydrogen Energy System: Areas Needing Further Research & Development".

Plenary Session Speaker at the Hydrogen Civilization Conference, 8 April 2005, Ankara, Turkey. At the opening of the conference, he gave a talk entitled "Hydrogen Civilization, Bringing Sustainable Development".

Invited speaker at the 58<sup>th</sup> Geology Congress, 11-13 April 2005, Ankara, Turkey. At the Opening Plenary Session, on Monday, 11 April 2005, Dr. Veziroglu gave a talk entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System and Hydrogen Storage in Geological Formations".

Invited speaker - together with Dr. Sergio Edgardo Acevedo, Governor of Santa Cruz State - to the Argentinean Hydrogen Energy Association Seminar at Pico Truncado, Santa Cruz State, Argentina, on 18 April 2005, attended by the State and Federal Government Dignitaries. Dr. Veziroglu made a presentation entitled "Hydrogen Energy System and Implementation in Argentina". After the Seminar, a Ceremony was held in the nearby village, Koluel Kayke, dedicating a new park to Drs. T. Nejat Veziroglu and Sergio Edgardo Acevedo for their efforts and special contributions to convert Koluel Kayke to the Hydrogen Energy System.

Invited lecturer at the monthly meeting of the Association of Engineers & Architects, 27 April 2005, Bakirkoy, Istanbul, Turkey. Dr. Veziroglu made a presentation entitled "Hydrogen Civilization: Implications for Engineering & Architecture".

Invited lecturer at the "Sustainable Energy Source: Hydrogen" Conference, 4 May 2005, Selcuk University, Konya, Turkey. At the Plenary Session, Dr. Veziroglu gave a talk entitled "Hydrogen Civilization: Possible Pilot Projects for Implementation".

Invited lecturer at the May Seminar of the Turkish World Cultural Center, Istanbul, Turkey, on Saturday, 7 May 2005. Dr. Veziroglu gave a talk entitled "Hydrogen Civilization: Resulting Benefits and Problems Facing the Implementation".

Panelist at the Renewable Energy Sources Round Table Discussion in the live program of Samanyolu TV, Istanbul, Turkey, on Sunday, 8 May 2005. At the Round Table Discussion, Dr. Veziroglu talked about the Hydrogen Energy System and answered the pertinent questions.

Invited lecturer at the 1st World Congress of Young Scientist on Hydrogen, 17-20 May 2005, Turin, Italy. On Wednesday morning, 18 May 2005, at the Opening Plenary Session, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System and Young Scientists".

Invited speaker at the IX Automotive and Suppliers Industries Symposium, 27-28 May 2005, Uludag University, Bursa, Turkey. At the Opening Plenary Session on Friday, 27 May 2005, Dr. Veziroglu made a presentation entitled "Hydrogen Energy System and Transportation". At the Closing Plenary Session on Saturday, 28 May 2005, he was a panelist at the Panel on "Automotive Industry Policies for Entry into the European Union", and presented a road map for the transformation of transport industry to Hydrogen Energy.

Presented with the Fair Play Award of the Year 2004 by the President of the Turkish National Olympics Committee in their annual Award Ceremony on Thursday, 26 May 2005, at the Olympiad House, Istanbul, Turkey.

Invited lecturer at the 8th Baku International Congress on Energy Ecology Economy, 30 May – 2 June 2005, Baku, Azerbaijan. At the Opening Plenary Session, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and UNIDO-ICHET activities

Invited lecturer at the New and Renewable Energy Sources Symposium, 2-4 June 2005, Kayseri, Turkey. Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and a Road map for Turkey for conversion to Hydrogen Economy".

Invited lecturer at the IV Solar Energy Institute Renewable Energy Symposium and Exhibition, 9-10 June 2005, Izmir, Turkey. Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and Pilot Projects for Implementation".

Invited speaker at the Hydrogen Energy Symposium, Istanbul Hilton Hotel, 11 June 2005, Istanbul, Turkey. At the opening of the Symposium, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System: Environmental and Economical Benefits".

Interviewed by Prof. Dr. Siddik Yarman on "Hydrogen Energy System and the Implications for Turkey", on his Technological Advances Program at the Technology TV Channel, Sunday, 2 July 2005, Istanbul, Turkey.

Invited speaker at the monthly Seminar of TEMA Foundation for Fighting Land Erosion and Deforestation, on Wednesday, 6 July 2005. Dr. Veziroglu gave a talk entitled "How Hydrogen Energy System Could Solve Environmental Problems Including Land Erosion and Deforestation?"

Invited speaker at the European Fuel Cell Forum, Friday, 8 July 2005. In the morning Plenary Session, Dr. Veziroglu made a presentation entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System" and then participated in the Round Table Discussion comparing Hydrogen Energy System with a possible all Electrical System.

Interviewed by the Television Channel TGRT on Hydrogen Energy and Implications for Economic Development and Environmental Protection, Sunday, 10 July 2005, Istanbul, Turkey.

Invited speaker at the Portland International Conference on Management of Engineering and Technology, 31 July-4 August 2005, Portland, Oregon, U.S.A. At the Plenary Session on Wednesday morning, 3 August 2005, he gave a talk entitled "Hydrogen Civilization".

Invited lecturer at the Federal University of Rio de Janeiro, Brazil, on Monday, 15 August 2005. Dr. Veziroglu gave a lecture entitled "21<sup>st</sup> Century's Energy: Hydrogen Energy System". In addition, he met with the Director of the Hydrogen Laboratory, their researchers and representatives from industry, and discussed the ways and the means of possible cooperation for the dissemination of the Hydrogen Energy Technologies, as well as a Hydrogen Energy Pilot Project for Rio de Janeiro.

Invited speaker by the Ministry of Cities in Brasilia, Brazil, on Friday, 12 August 2005. Dr. Veziroglu gave a talk entitled "Hydrogen Energy System and Implications for Brazil". In addition he met with the Minister for Cities, the Secretary of State and the Engineering Staff of the Minister of Cities and discussed the introduction of hydrogen-fuelled public transportation in Brazilian cities, as well as a Hydrogen fuelled bus project.

Invited Lecturer at the International Forum for Social Sciences and Health (IFSSH) World Congress, Yeditepe University, Istanbul, Turkey. On Tuesday, 23 August 2005 at the Plenary Session III, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System: Permanent Solution to Health Problems Caused by Fossil Fuel Utilization".

Participant at the 1<sup>st</sup> International Symposium and Exhibition on Environment - Friendly Energy Sources and Technology, 4-5 September 2005, Cesme, Izmir, Turkey. At the Opening Plenary Session, on Monday, 5 September 2005, he gave the Keynote Address entitled "Hydrogen Civilization and UNIDO-ICNET Activities".

Invited Speaker at 2005 World Physics Year International Physics Congress, 12-13 September 2005, Mugla University, Mugla, Turkey. At the Opening Plenary Session, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and UNIDO International Centre for Hydrogen Energy Technologies".

Invited speaker at the Automotive Research Center Seminar, Friday, 23 September 2005, at the Istanbul Technical University, Istanbul, Turkey. Dr. Veziroglu gave a lecture entitled "Hydrogen Energy System and UNIDO-ICNET Activities".

Invited Participant at the International Energy Agency - Hydrogen Implementation Agreement (IEA - HIA) Meeting, 5-7 October 2005, Singapore. At this Meeting, Dr. Veziroglu gave a talk about the mission and activities of the UNIDO International Centre for Hydrogen Energy Technologies. He also pointed out that the missions of UNIDO-ICNET, IEA-HIA (International Energy Agency - Hydrogen Implementing Agreement) and IPHE (International Partnership on Hydrogen Economy) were almost identical, and therefore the three organizations should closely cooperate with each other.

Honorary chairman of the World Hydrogen Technologies Convention, 1-5 October 2005, Singapore. At the Opening Plenary Session on Monday, 3 October 2005, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and its Implementation".

Invited speaker at the Gebze Association of Industrialists and Businessmen Seminar on Hydrogen Energy, 26 October 2005, Gebze, Izmit, Turkey. Dr. Veziroglu gave a talk entitled "Hydrogen Energy and Pilot Projects".

Conferred with the **Call to World Peace from the Universal Brotherhood Award** for his valuable contributions to World Peace and the future of Humanity with his research on clean energy as an alternative to fossil fuels by the Mevlana Supreme Foundation at their Annual Awards Meeting held on Tuesday, 1 November 2005, Istanbul, Turkey.

Invited speaker at the 2<sup>nd</sup> 2005 International Forum on Clean Fuel Cell, Mokpo City, South Korea, 8 November 2005. At the Opening Plenary Session, Dr. Veziroglu gave the Keynote Address entitled "Hydrogen Energy System and Implementation Activities". In the Closing Plenary Session, Dr. Veziroglu participated in the Roundtable Discussion. Also, Dr. Veziroglu had a working luncheon with Dr. Joon Yung Park, Governor of Jeollanamdo Province, and made recommendations to the Governor for establishing Hydrogen Energy Pilot Projects in his Province.

Invited speaker at the Energy & Environment Group Meeting of the ROK (Republic of Korea) Parliament Members and Industrialists, Seoul, South Korea, 10 November 2005. He gave a talk on Hydrogen Energy System and made recommendations for the introduction of Hydrogen Energy Technologies in South Korea.

Conferred with "Doctor Honories Causa" by the Senate and the President of Osmangazi University, Eskisehir, Turkey, for his contributions to Hydrogen Energy on Monday, 28 November 2005. In response, Dr. Veziroglu made a presentation on the history of hydrogen energy system concept and the future possibilities to the faculty and students of the Osmangazi University.

Invited Speaker at Middle East Forum on Fuel Cells and Hydrogen Economy (MEFH), 6-7 December 2005, Dubai, U.A.E. On 7 December 2005, Dr. Veziroglu gave a talk entitled "Hydrogen Economy Implementation and UNIDO-ICHET".

Invited Lecturer at the Kultur University, Istanbul, Turkey. On Wednesday, 14 December 2005, Dr. Veziroglu gave a talk entitled "Hydrogen Energy System and UNIDO-ICHET Activities".

Presented with the Annual Excellence in Professional Service Award for Proposing Hydrogen Economy and Striving Towards its Establishments by Beykoz Rotary Club at their Dinner Meeting on Wednesday, 14 December 2005, Istanbul, Turkey.

Presented with Distinguished Service Award for 50 Years of Service at the Annual Dinner of the Chamber of Mechanical Engineers, Mersin, Turkey, on Friday, 16 December 2005. On Saturday, 17 December 2005, Dr. Veziroglu gave an Invited Talk entitled "Hydrogen Energy System and UNIDO-ICHET Activities" to the members of the Chamber of Mechanical Engineers.

Invited Speaker at the Water Foundation Seminar, 29 December 2005, Istanbul, Turkey. At the Seminar, Dr. Veziroglu gave a talk entitled “21<sup>st</sup> Century’s Energy: Hydrogen Energy Seminar & UNIDO-ICHET Activities”.

Honorary Chairman of the Hydrogen Technologies for Energy Production (HTEP) International Forum, organized as an official event within the framework of Presidency of the Russian Federation in G8 2006 Summit, 6-10 February 2006, Moscow, Russia. At the Opening of the International Forum, Dr. Veziroglu gave the Keynote Address entitled “21st Century’s Energy: Hydrogen Energy System”. At the Forum Dr. Veziroglu presented the following resolution: “It is hereby resolved by HTEP participants to ask G8 2006 Summit host country leader, President Putin of Russian Federation, to make the following request to the G8 Leaders: In order to provide the permanent and sustainable solution to the most important and interrelated global problems of the speedy depletion of fossil fuels and the environmental damage being caused by their utilization, they should prepare a viable program of converting the world to Hydrogen Economy, and start implementing it”. At the meeting, Dr. Veziroglu was presented with a Plaque for contributing to the development of Hydrogen Energy.

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